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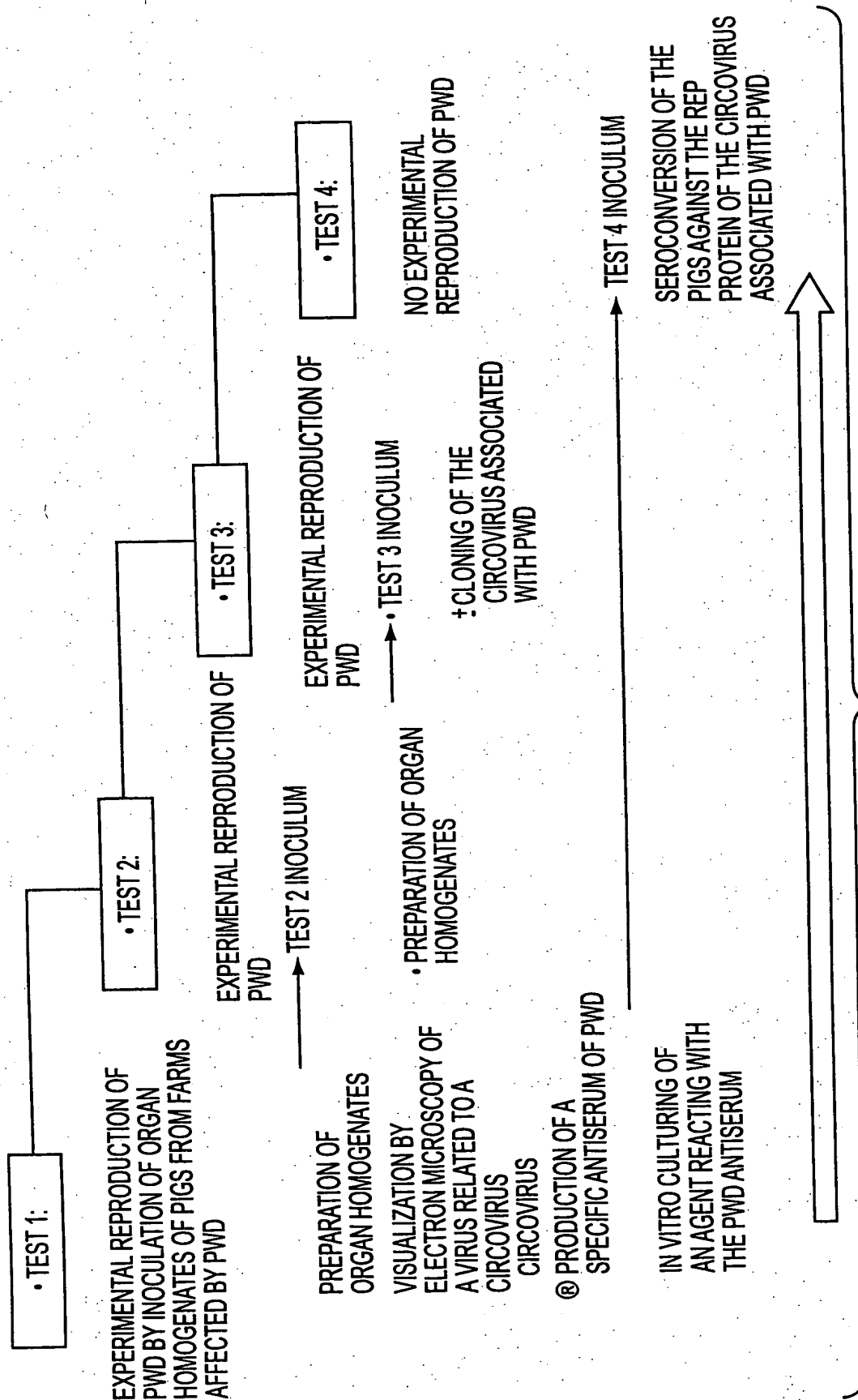


FIG. 1

Leu Ala Ser Arg Cys Arg Cys Cys Arg Pro Leu Thr Leu Ser Phe Ala Leu Cys
Trp Arg Val Glu Ala Ala Ala Ala Gly Arg Cys Arg *** His Phe His Trp Ala
Gly Ala Cys Lys Pro Leu Pro Leu Val Glu Ala Ala Asp Thr Phe Ile Gly Leu

3' TGG TCG CGT GAA GCC GTC GCC GTC GTG GAG CCG TCG CAG TCA CTT TTA CGG TTC
9 18 27 36 45 54
5' ACC AGC GCA CTT CGG CAG CGG CAG CAC CTC GGC AGC GTC AGT GAA AAT GCC AAG

Thr Ser Ala Leu Arg Gln Arg Gln His Leu Gly Ser Val Ser Glu Asn Ala Lys
Pro Ala His Phe Gly Ser Gly Ser Thr Ser Ala Ala Ser Val Lys Met Pro Ser
Gln Arg Thr Ser Ala Ala Ala Ala Pro Arg Gln Arg Gln *** Lys Cys Gln Ala

Ser Phe Arg Gly Ala Val Gly Tyr Ser Thr Pro Thr *** Gly *** Tyr Asp Lys
Leu Phe Ala Ala Arg Leu Gly Met Leu Pro Pro His Glu Gly Lys Ile Ile Arg
Leu Phe Leu Pro Gly Cys Gly Trp Leu Leu His Thr Asn Val Arg Leu Leu Gly

GTT CTT TTC GCC GGG CGT TGG GGT ATT CTC CAC CCA CAA GTG GGA ATT ATT AGG
63 72 81 90 99 108
CAA GAA AAG CGG CCC GCA ACC CCA TAA GAG GTG GGT GTT CAC CCT TAA TAA TCC

Gln Glu Lys Arg Pro Ala Thr Pro *** Glu Val Gly Val His Pro *** *** Ser
Lys Lys Ser Gly Pro Gln Pro His Lys Arg Trp Val Phe Thr Leu Asn Asn Pro
Arg Lys Ala Ala Arg Asn Pro Ile Arg Gly Gly Cys Ser Pro Leu Ile Ile Leu

Arg Pro Pro Ser Phe Cys Phe Val Pro Ala Glu Leu Arg Gly Lys Gln Asn Asn
Gly Leu Leu Leu Phe Val Phe Tyr Pro Leu Lys Trp Asp Gly Lys Lys Ile Ile
Glu Ser Ser Ser Phe Phe Leu Ile Arg Ser Ser Gly Ile Glu Arg Lys Ser ***

AAG GCT CCT CCT CTT TTT GTT TTA TGC CCT CGA AGG TTA GAG GGA AAA ACT AAT
117 126 135 144 153 162
TTC CGA GGA GGA GAA AAA CAA AAT ACG GGA GCT TCC AAT CTC CCT TTT TGA TTA

Phe Arg Gly Gly Glu Lys Gln Asn Thr Gly Ala Ser Asn Leu Pro Phe *** Leu
Ser Glu Glu Glu Lys Asn Lys Ile Arg Glu Leu Pro Ile Ser Leu Phe Asp Tyr
Pro Arg Arg Arg Lys Thr Lys Tyr Gly Ser Phe Gln Ser Pro Phe Leu Ile Ile

Gln Lys His Arg Pro Leu Asn Pro Leu Pro Tyr Phe Glu Glu Gly Gly Pro Thr
Lys Asn Thr Ala Leu Phe Thr Gln Phe Leu Thr Ser Ser Arg Val Glu Leu Pro
Lys Thr Gln Pro Ser Ser Pro Lys Ser Ser Pro Leu Val Gly *** Arg Trp Pro

AAA ACA AAC ACC GCT CCT TCC AAA CCT TCT CCC ATC TTG AGG AGT GGA GGT CCC
171 180 189 198 207 216
TTT TGT TTG TGG CGA GGA AGG TTT GGA AGA GGG TAG AAC TCC TCA CCT CCA GGG

Phe Cys Leu Trp Arg Gly Arg Phe Gly Arg Gly *** Asn Ser Ser Pro Pro Gly
Phe Val Cys Gly Glu Glu Gly Leu Glu Glu Gly Arg Thr Pro His Leu Gln Gly
Leu Phe Val Ala Arg Lys Val Trp Lys Arg Val Glu Leu Leu Thr Ser Arg Gly

Gln Ser Asn Gln *** Ser Ala Ser Lys *** Cys Pro Ser Thr Thr Asn Gln His
Lys Arg Ile Lys Ser Leu Leu Leu Ser Lys Val Leu His Leu Pro Ile Lys Thr
Asn Ala Phe Lys Ala Leu Phe Cys Val Lys Leu Leu Thr Phe His Tyr Lys Pro

CAA ACG CTT AAA ACG ATT CTT CGT CTG AAA ATT GTT CCA CTT CAC CAT AAA ACC
225 234 243 252 261 270
GTT TGC GAA TTT TGC TAA GAA GCA GAC TTT TAA CAA GGT GAA GTG CTA TTT TGG

Val Cys Glu Phe Cys *** Glu Ala Asp Phe *** Gln Gly Glu Val Val Phe Trp
Phe Ala Asn Phe Ala Lys Lys Gln Thr Phe Asn Lys Val Lys Trp Tyr Phe Gly
Leu Arg Ile Leu Leu Arg Ser Arg Leu Leu Thr Arg *** Ser Gly Ile Leu Val

FIG. 2a

Gly Ser Gly Cys Arg Ser Leu Ser Leu Phe Arg Gly Ala Ser Tyr Leu Ile Ser
Gly Ala Ala Val Asp Leu Phe Arg Phe Ser Gly Val Leu Leu Ile Phe Phe Val
Ala Arg Gln Trp Met Ser Phe Ala Phe Pro Val Ser Trp Cys Phe Leu Ser Tyr
ACG GGC GAC GGT GTA GCT CTT TCG CTT TCC TTG GCT GGT CGT CTT ATT TCT TAT
279 288 297 306 315 324
TGC CCG CTG CCA CAT CGA GAA AGC GAA AGG AAC CGA CCA GCA GAA TAA AGA ATA
Cys Pro Leu Pro His Arg Glu Ser Glu Arg Asn Arg Pro Ala Glu *** Arg Ile
Ala Arg Cys His Ile Glu Lys Ala Lys Gly Thr Asp Gln Gln Asn Lys Glu Tyr
Pro Ala Ala Thr Ser Arg Lys Arg Lys Glu Pro Thr Ser Arg Ile Lys Asn Thr
Cys Tyr Leu Leu Gly Cys Val *** Arg Thr His Leu Glu Ala Ser Gly Pro Ser
Ala Thr Phe Phe Ala Val Tyr Lys Asp Leu Thr Ser Ser Arg Pro Val Leu Pro
Gln Leu Leu Ser Pro Trp Met Ser Ile Ser His Pro Ala Gly Arg Phe Trp Pro
GAC GTC ATT TCT TCC GGT GTA TGA ATA GCT CAC ACC TCG AGG CGC CTT GGT CCC
333 342 351 360 369 378
CTG CAG TAA AGA AGG CCA CAT ACT TAT CGA GTG TGG AGC TCC GCG GAA CCA GGG
Leu Gln *** Arg Arg Pro His Thr Tyr Arg Val Trp Ser Ser Ala Glu Pro Gly
Cys Ser Lys Glu Gly His Ile Leu Ile Glu Cys Gly Ala Pro Arg Asn Gln Gly
Ala Val Lys Lys Ala Thr Tyr Leu Ser Ser Val Glu Leu Arg Gly Thr Arg Gly
Ala Cys Arg Gly Thr *** Gln Gln Ser Tyr Gly Lys Pro Ser Pro Thr Lys Pro
Leu Ala Ala Val Gln Arg Ser Ser His Thr Gly Lys Gln Leu Arg Pro Arg Gln
Phe Arg Leu Ser Arg Asp Val Ala Thr Leu Val Arg Lys Ser Val Pro Asp Lys
CTT CGC GTC GCT GGA CAG ATG ACG ACA CTC ATG GGA AAA CCT CTG CCC CAG AAA
387 396 405 414 423 432
GAA GCG CAG CGA CCT GTC TAC TGC TGT GAG TAC CCT TTT GGA GAC GGG GTC TTT
Glu Ala Gln Arg Pro Val Tyr Cys Cys Glu Tyr Pro Phe Gly Asp Gly Val Phe
Lys Arg Ser Asp Leu Ser Thr Ala Val Ser Thr Leu Leu Glu Thr Gly Ser Leu
Ser Ala Ala Thr Cys Leu Leu Leu *** Val Pro Phe Trp Arg Arg Gly Leu Trp
Ser Gln Leu Arg Ala Thr Glu Gln Leu Thr His Ser Phe Asn Gly Arg Ala Pro
His Ser Tyr Gly Leu Leu Lys Arg Tyr Arg Ile His Ser Ile Glu Ala Pro Gln
Thr Val Thr Ala Ser Cys Asn Gly Thr Val Tyr Thr Leu Phe Lys Arg Pro Ser
CCA CTG ACA TCG GCT CGT CAA AGG ACA TTG CAT ACA CTC TTT AAA GGC GCC CGA
441 450 459 468 477 486
GGT GAC TGT AGC CGA GCA GTT TCC TGT AAC GTA TGT GAG AAA TTT CCG CGG GCT
Gly Asp Cys Ser Arg Ala Val Ser Cys Asn Val Cys Glu Lys Phe Pro Arg Ala
Val Thr Val Ala Glu Gln Phe Pro Val Thr Tyr Val Arg Asn Phe Arg Gly Leu
*** Leu *** Pro Ser Ser Phe Leu *** Arg Met *** Glu Ile Ser Ala Gly Trp
Gln Val Lys Ser Leu Ser Arg Ser Ser Ala Ala Ala His Asn Ser Ser Leu Gln
Ser Phe Lys Gln Phe His Ala Pro Leu His Leu Leu Thr Ile Pro Leu Cys Ser
Ala Ser Ser Lys Phe Thr Leu Pro Phe Ile Cys Cys Arg Ser Gln Phe Val Ala
CCG ACT TGA AAA CTT TCA CTC GCC CTT CTA CGT CGT CGC ACT AAC CTT CTG TCG
495 504 513 522 531 540
GGC TGA ACT TTT GAA AGT GAG CGG GAA GAT GCA GCA GCG TGA TTG GAA GAC AGC
Gly *** Thr Phe Glu Ser Glu Arg Glu Asp Ala Ala Ala *** Leu Glu Asp Ser
Ala Glu Leu Leu Lys Val Ser Gly Lys Met Gln Gln Arg Asp Trp Lys Thr Ala
Leu Asn Phe *** Lys *** Ala Gly Arg Cys Ser Ser Val Ile Gly Arg Gln Leu

FIG. 2b

Val Arg *** Leu Pro Gly Ala Arg Asn His Ser Ser Gly Thr Pro Gly Tyr Asn
Tyr Val Asp Tyr His Ala Arg Gly Thr Thr Pro Leu Ala Leu Pro Gly Thr Ile
Thr Cys Thr Met Thr Pro Gly Gly Pro Gln Pro Phe Leu Trp His Ala Arg Leu

ACA TGT GCA GTA TCA CCC GGG CGG GCC AAC ACC CTT CTC GGT CAC CCG GGC ATT
549 558 567 576 585 594
TGT ACA CGT CAT AGT GGG CCC GCC CGG TTG TGG GAA GAG CCA GTG GGC CCG TAA

Cys Thr Arg His Ser Gly Pro Ala Arg Leu Trp Glu Glu Pro Val Gly Pro ***
Val His Val Ile Val Gly Pro Pro Gly Cys Gly Lys Ser Gln Trp Ala Arg Asn
Tyr Thr Ser *** Trp Ala Arg Pro Val Val Gly Arg Ala Ser Gly Pro Val Ile

Gln Gln Ala *** Pro Cys Arg Ser Ser Ala *** Tyr Phe Tyr Thr Thr Pro His
Lys Ser Leu Arg Pro Val Gly Val Pro Leu Arg Thr Ser Ile Leu Pro Pro Ile
Lys Ala Ser Gly Leu Ser Val *** Gln Phe Gly Leu Leu Phe Leu His His Ser

AAA ACG ACT CGG ATC CCT GTG GAT GAC CTT CGG ATC ATC TTT ATT CAC CAC CCT
603 612 621 630 639 648
TTT TGC TGA GCC TAG GGA CAC CTA CTG GAA GCC TAG TAG AAA TAA GTG GTG GGA

Phe Cys *** Ala *** Gly His Leu Leu Glu Ala *** *** Lys *** Val Val Gly
Phe Ala Glu Pro Arg Asp Thr Tyr Trp Lys Pro Ser Arg Asn Lys Trp Trp Asp
Leu Leu Ser Leu Gly Thr Pro Thr Gly Ser Leu Val Glu Ile Ser Gly Gly Met

Ile Asp His Leu Leu Leu Gln Gln Lys Pro His Asn Lys His Ser Thr Val Lys
Ser Ile Met Ser Phe Phe Asn Asn Asn Gln Ile Ile Lys Ile Ala Pro *** Arg
Pro Tyr *** Pro Ser Ser Thr Thr Thr Lys Ser Ser Lys *** Pro Gln Asn Gly

ACC TAT AGT ACC TCT TCT TCA ACA ACA AAA CCT ACT AAA AAT ACC GAC CAA TGG
657 666 675 684 693 702
TGG ATA TCA TGG AGA AGA AGT TGT TGT TTT GGA TGA TTT TTA TGG CTG GTT ACC

Trp Ile Ser Trp Arg Arg Ser Cys Cys Phe Gly *** Phe Leu Trp Leu Val Thr
Gly Tyr His Gly Glu Glu Val Val Val Leu Asp Asp Phe Tyr Gly Trp Leu Pro
Asp Ile Met Glu Lys Lys Leu Leu Phe Trp Met Ile Phe Met Ala Gly Tyr Leu

Pro His Asp Val Ser Val Thr His Gly Thr Asp Met Ser Gln Leu Ser *** Leu
Pro Ile Ile *** Gln Ser Gln Thr Val Pro Ile Trp Gln Ser Tyr Leu Ser Phe
Gln Ser Ser Arg Ser Leu Ser His Ser Arg Tyr Gly Asn Val Thr Ser Val Leu

AAC CCT ACT AGA TGA CTC TGA CAC ACT GGC CAT AGG TAA CTG ACA TCT CTG ATT
711 720 729 738 747 756
TTG GGA TGA TCT ACT GAG ACT GTG TGA CCG GTA TCC ATT GAC TGT AGA GAC TAA

Leu Gly *** Ser Thr Glu Thr Val *** Pro Val Ser Ile Asp Cys Arg Asp ***
Trp Asp Asp Leu Leu Arg Leu Cys Asp Arg Tyr Pro Leu Thr Val Glu Thr Lys
Gly Met Ile Tyr *** Asp Cys Val Thr Gly Ile His *** Leu *** Arg Leu Lys

Pro Tyr Gln Glu Lys Lys Pro Gly Cys Tyr Lys Ser *** Trp Cys Asp Pro Gly
Pro Thr Ser Asn Arg Lys Gln Gly Ala Thr Asn Gln Asn Gly Ala Ile Leu Gly
Pro Pro Val Thr Gly Lys Lys Ala Arg Leu Ile Lys Ile Val Leu Leu *** Ala

TCC CCC ATG ACA AGG AAA AAA CCG GGC GTC ATA AAA CTA ATG GTC GTT AGT CCG
765 774 783 792 801 810
AGG GGG TAC TGT TCC TTT TTT GGC CCG CAG TAT TTT GAT TAC CAG CAA TCA GGC

Arg Gly Tyr Cys Ser Phe Phe Gly Pro Gln Tyr Phe Asp Tyr Gln Gln Ser Gly
Gly Gly Thr Val Pro Phe Leu Ala Arg Ser Ile Leu Ile Thr Ser Asn Gln Ala
Gly Val Leu Phe Leu Phe Trp Pro Ala Val Phe *** Leu Pro Ala Ile Arg Pro

FIG. 2c

Gly Pro Ile Thr Ser Arg Leu Gln Gln Gly Leu Gln Leu Leu Glu Arg Asp Ser
Gly Leu Phe Pro Val Gly *** Ser Ser Asp Trp Ser Tyr Phe Ser Glu Ile Pro
Gly Trp Ser His Tyr Glu Glu Val Ala Thr Gly Ala Thr Ser Ala Arg *** Arg

GGG GGT CCT TAC CAT GAG GAG TTG ACG ACA GGG TCG ACA TCT TCG AGA GAT AGC
819 828 837 846 855 864
CCC CCA GGA ATG GTA CTC CTC AAC TGC TGT CCC AGC TGT AGA AGC TCT CTA TCG

Pro Pro Gly Met Val Leu Leu Asn Cys Cys Pro Ser Cys Arg Ser Ser Leu Ser
Pro Gln Glu Trp Tyr Ser Ser Thr Ala Val Pro Ala Val Glu Ala Leu Tyr Arg
Pro Arg Asn Gly Thr Pro Gln Leu Leu Ser Gln Leu *** Lys Leu Ser Ile Gly

Ser *** *** Lys Ala Ile Lys Ser Ser Gln Gln Leu Val Ile Trp Pro Pro Val
Pro Asn Ser Ser Gln Leu Lys Pro Leu Ser Ser Ser Phe Leu Gly Arg Leu Tyr
Leu Ile Val Val Lys Cys Asn Gln Phe Val Ala Pro Ser Cys Asp Val Ser Thr

CTC CTA ATG ATG AAA CGT TAA AAC CTT CTG ACG ACC TCT TGT TAG GTG CCT CCA
873 882 891 900 909 918
GAG GAT TAC TAC TTT GCA ATT TTG GAA GAC TGC TGG AGA ACA ATC CAC GGA GGT

Glu Asp Tyr Tyr Phe Ala Ile Leu Glu Asp Cys Trp Arg Thr Ile His Gly Gly
Arg Ile Thr Thr Leu Gln Phe Trp Lys Thr Ala Gly Glu Gln Ser Thr Glu Val
Gly Leu Leu Leu Cys Asn Phe Gly Arg Leu Leu Glu Asn Asn Pro Arg Arg Tyr

Arg Leu Gly Ile Gln Leu Leu Pro Gly Val Arg His Gly Lys Gly Met Tyr Phe
Gly Phe Ala Ser Lys Phe Cys His Val Trp Gly Thr Gly Lys Glu Trp Ile Phe
Gly Ser Pro Arg Asn Ser Ala Thr Ser Gly Gly Gln Ala Arg Lys Gly Tyr Leu

TGG GCT TCC GGC TAA ACT TCG TCA CCT GGG TGG GAC ACG GGA AAA GGG TAT ATT
927 936 945 954 963 972
ACC CGA AGG CCG ATT TGA AGC AGT GGA CCC ACC CTG TGC CCT TTT CCC ATA TAA

Thr Arg Arg Pro Ile *** Ser Ser Gly Pro Thr Leu Cys Pro Phe Pro Ile ***
Pro Glu Gly Arg Phe Glu Ala Val Asp Pro Pro Cys Ala Leu Phe Pro Tyr Lys
Pro Lys Ala Asp Leu Lys Gln Trp Thr His Pro Val Pro Phe Ser His Ile Lys

Leu Asn Ser Leu Arg Lys Gln *** *** Met Thr Ile Thr Lys Ile Lys Ile ***
Tyr Ile Val Ser Asp Lys Lys Asn Asp Cys Arg Leu Pro Lys *** Lys *** Glu
Ile Phe *** Gln Thr Lys Lys Thr Ile Val Asp Tyr His Asn Lys Asn Lys Asn

TTA TTT AAT GAC TCA GAA AAA ACA ATA GTG TAG CAT TAC CAA AAA TAA AAA TAA
981 990 999 1008 1017 1026
AAT AAA TTA CTG AGT CTT TTT TGT TAT CAC ATC GTA ATG GTT TTT ATT TTT ATT

Asn Lys Leu Leu Ser Leu Phe Cys Tyr His Ile Val Met Val Phe Ile Phe Ile
Ile Asn Tyr *** Val Phe Phe Val Ile Thr Ser *** Trp Phe Leu Phe Leu Phe
*** Ile Thr Glu Ser Phe Leu Leu Ser His Arg Asn Gly Phe Tyr Phe Tyr Ser

Lys Ser Pro Arg Glu Pro Tyr Ile Arg Gln Ile Thr Cys Leu Tyr Asp Val Lys
Asn Leu Pro Asp Lys Leu Ile Phe Glu Arg Phe Gln Val Tyr Ile Thr Leu Arg
Met *** Leu Thr Lys *** Ser Leu Asn Glu Ser Asn Tyr Met Phe Leu *** Gly

GTA AAT CTC CCA GAA AGT CCT ATT TAA GAG ACT TAA CAT GTA TTT ATC AGT TGG
1035 1044 1053 1062 1071 1080
CAT TTA GAG GGT CTT TCA GGA TAA ATT CTC TGA ATT GTA CAT AAA TAG TCA ACC

His Leu Glu Gly Leu Ser Gly *** Ile Leu *** Ile Val His Lys *** Ser Thr
Ile *** Arg Val Phe Gln Asp Lys Phe Ser Glu Leu Tyr Ile Asn Ser Gln Pro
Phe Arg Gly Ser Phe Arg Ile Asn Ser Leu Asn Cys Thr *** Ile Val Asn Leu

FIG. 2d

Gly Cys Leu Lys Pro Ser His Asn Cys Lys Pro Ala Cys Leu Gly Pro Arg His
Val Val Tyr Asn Gln Ala Thr Thr Ala Asn Gln Leu Ala Tyr Gly Leu Gly Thr
*** Trp Met Ile Lys Pro Gln Pro Gln Met Lys Ser Arg Met Ala Trp Ala Gln

AAT GGT GTA TTA AAA CCC GAC ACC AAC GTA AAA CCT CGC GTA TCG GGT CCG GAC
1089 1098 1107 1116 1125 1134
TTA CCA CAT AAT TTT GGG CTG TGG TTG CAT TTT GGA GCG CAT AGC CCA GGC CTG

Leu Pro His Asn Phe Gly Leu Trp Leu His Phe Gly Ala His Ser Pro Gly Leu
Tyr His Ile Ile Leu Gly Cys Gly Cys Ile Leu Glu Arg Ile Ala Gln Ala Cys
Thr Thr *** Phe Trp Ala Val Val Ala Phe Trp Ser Ala *** Pro Arg Pro Val

Ala Arg Cys Gln His Pro Tyr Lys Phe Pro Ala Val Ala Pro Lys Lys *** ***
His Glu Val Asn Thr His Thr Asn Leu His Leu Trp Leu Gln Asn Arg Lys Asn
Thr Ser Ser Met Pro Thr Pro Ile *** Ile Ser Gly Cys Ser Thr Glu Lys Ile

ACA CGA GCT GTA ACC ACA CCC ATA AAT TTA CCT CGG TGT CGA CCA AAG AAA ATA
1143 1152 1161 1170 1179 1188
TGT GCT CGA CAT TGG TGT GGG TAT TTA AAT GGA GCC ACA GCT GGT TTC TTT TAT

Cys Ala Arg His Trp Cys Gly Tyr Leu Asn Gly Ala Thr Ala Gly Phe Phe Tyr
Val Leu Asp Ile Gly Val Gly Ile *** Met Glu Pro Gln Leu Val Ser Phe Ile
Cys Ser Thr Leu Val Trp Val Phe Lys Trp Ser His Ser Trp Phe Leu Leu Leu

Lys Ala Pro Val Leu *** Asn Asn Pro Arg Ala Arg Thr Gln Pro His Leu Val
Asn Pro Gln Phe Trp Asp Ile Thr Gln Asp Leu Glu Pro Lys Pro Thr Phe Tyr
Ile Gln Ser Ser Gly Ile Leu Gln Lys Thr *** Ser Gln Asn Pro Pro Ser Thr

ATA AAC CGA CCT TGG TTA GTT AAC AAA CCA GAT CGA GAC CAA ACC CCC ACT TCA
1197 1206 1215 1224 1233 1242
TAT TTG GCT GGA ACC AAT CAA TTG TTT GGT CTA GCT CTG GTT TGG GGG TGA AGT

Tyr Leu Ala Gly Thr Asn Gln Leu Phe Gly Leu Ala Leu Val Trp Gly *** Ser
Ile Trp Leu Glu Pro Ile Asn Cys Leu Val *** Leu Trp Phe Gly Gly Gly Val
Phe Gly Trp Asn Gln Ser Ile Val Trp Ser Ser Ser Gly Leu Gly Val Lys Tyr

Gln Leu Pro Leu Tyr Leu Ala Ala Lys His His Pro Pro Leu Leu Leu *** Tyr
Arg Ser His Tyr Thr Phe Pro Gln Arg Ile Thr His Arg Ser Ser Tyr Asn Ile
Gly Pro Thr Thr Pro Leu Pro Ser Gly *** Pro Thr Ala Pro Pro Thr Thr Leu

TGG ACC TCA CCA TCC ATT TCC CGA CGG AAT ACC ACA CCG CCC TCC TCA TCA ATT
1251 1260 1269 1278 1287 1296
ACC TGG AGT GGT AGG TAA AGG GCT GCC TTA TGG TGT GCG GGG AGG AGT AGT TAA

Thr Trp Ser Gly Arg *** Arg Ala Ala Leu Trp Cys Gly Gly Arg Ser Ser ***
Pro Gly Val Val Gly Lys Gly Leu Pro Tyr Gly Val Ala Gly Gly Val Val Asn
Leu Glu Trp *** Val Lys Gly Cys Leu Met Val Trp Arg Glu Glu *** Leu Ile

Leu Pro *** Leu Gly Leu Gln His Leu Pro Asn Cys Leu Gln Cys Gly Leu Tyr
Tyr Pro Asp Tyr Ala Leu Asn Thr Ser Pro Thr Val Phe Asn Ala Asp Leu Ile
Ile Pro Thr Met Pro Trp Thr Pro Pro Pro Pro *** Leu Thr Pro Met Trp Ser

ATA TCC CCA GTA TCC GGT TCA ACC ACC TCC CCC AAT GTT TCA ACC GTA GGT TCT
1305 1314 1323 1332 1341 1350
TAT AGG GGT CAT AGG CCA AGT TGG TGG AGG GGG TTA CAA AGT TGG CAT CCA AGA

Tyr Arg Gly His Arg Pro Ser Trp Trp Arg Gly Leu Gln Ser Trp His Pro Arg
Ile Gly Val Ile Gly Gln Val Gly Gly Gly Gly Tyr Lys Val Gly Ile Gln Asp
*** Gly Ser *** Ala Lys Leu Val Glu Gly Val Thr Lys Leu Ala Ser Lys Ile

FIG. 2e

Cys Cys His Val Trp Cys Arg Lys Ser *** Leu His His Pro Arg Gln Pro Leu
Val Val Thr Ser Gly Val Gly Arg Gln Asn Ser Thr Ile Pro Asp Arg Pro Tyr
Leu Leu Leu Pro Gly Leu Val Glu Lys Ile Leu Pro Ser Pro Thr Glu Pro Thr
ATT GTT GTC ACC TGG GTT GTG GAG AAA CTA ATC TCC ACT ACC CCA GAG ACC CCA
1359 1368 1377 1386 1395 1404
TAA CAA CAG TGG ACC CAA CAC CTC TTT GAT TAG AGG TGA TGG GGT CTC TGG GGT
Gln Gln Trp Thr Gln His Leu Phe Asp *** Arg *** Trp Gly Leu Trp Gly
Asn Asn Ser Gly Pro Asn Thr Ser Leu Ile Arg Gly Asp Gly Val Ser Gly Val
Thr Thr Val Asp Pro Thr Pro Leu *** Leu Glu Val Met Gly Ser Leu Gly ***
Ile *** Ile *** Gly Lys *** Tyr Pro Leu Ile Pro Phe Thr Pro Thr Pro Pro
Phe Glu Tyr Lys Ala Lys Arg Ile Arg Tyr Tyr Gln Phe Pro Leu Pro Leu Pro
Phe Asn Met Asn Leu Arg Glu Leu Val Thr Thr Asn Ser Leu Tyr Pro Tyr Pro
TTT TAA GTA TAA ATC GGA AAG ATT ATG CCA TCA TAA CCT TTC CAT CCC CAT CCC
1413 1422 1431 1440 1449 1458
AAA ATT CAT ATT TAG CCT TTC TAA TAC GGT AGT ATT GGA AAG GTA GGG GTA GGG
Lys Ile His Ile *** Pro Phe *** Tyr Gly Ser Ile Gly Lys Val Gly Val Gly
Lys Phe Ile Phe Ser Leu Ser Asn Thr Val Val Leu Glu Arg *** Gly *** Gly
Asn Ser Tyr Leu Ala Phe Leu Ile Arg *** Tyr Trp Lys Gly Arg Gly Arg Gly
Gln His Arg Arg Leu Pro Pro Pro Val Pro Arg His Gln Ile Glu Ala Arg ***
Asn Thr Gly Gly Ser Pro Pro Leu Phe Gln Gly Ile Asn Phe Arg Leu Glu Asn
Thr Pro Ala Ala Gln Pro Pro Ser Ser Ser Ala Ser Thr Ser Asp *** Ser Thr
CCA ACC ACG GCG GAC TCC CCC CCT CCT TGA CCG GCT ACA ACT TAG AGT CGA GCA
1467 1476 1485 1494 1503 1512
GGT TGG TGC CGC CTG AGG GGG GGA GGA ACT GGC CGA TGT TGA ATC TCA GCT CGT
Gly Trp Cys Arg Leu Arg Gly Gly Gly Thr Gly Arg Cys *** Ile Ser Ala Arg
Val Gly Ala Ala *** Gly Gly Glu Glu Leu Ala Asp Val Glu Ser Gln Leu Val
Leu Val Pro Pro Glu Gly Gly Arg Asn Trp Pro Met Leu Asn Leu Ser Ser Leu
Cys Glu Leu Ile Ala Ala Leu Thr Arg Arg Lys His His Thr Cys Ile Arg ***
Val Asn Trp Ser Pro Gln Ser His Gly Gly Arg Ile Thr Leu Val Phe Glu Arg
Leu Met Gly Leu His Ser Arg Thr Asp Glu Glu *** Pro Ser Tyr Leu Asn Glu
ATT GTA AGG TTC TAC CGA CGC TCA CAG GAG GAG AAT ACC ACT CAT GTT TAA GAG
1521 1530 1539 1548 1557 1566
TAA CAT TCC AAG ATG GCT GCG AGT GTC CTC CTC TTA TGG TGA GTA CAA ATT CTC
*** His Ser Lys Met Ala Ala Ser Val Leu Leu Leu Trp *** Val Gln Ile Leu
Asn Ile Pro Arg Trp Leu Arg Val Ser Ser Ser Tyr Gly Glu Tyr Lys Phe Ser
Thr Phe Gln Asp Gly Cys Glu Cys Pro Pro Leu Met Val Ser Thr Asn Ser Leu
Phe Pro Pro Phe Gln Leu Tyr Gly Asp Lys Pro Ala Met Gln Leu Pro Lys Gln
Ser Leu Arg Ser Asn Phe Ile Gly Thr Lys Arg Arg Trp Arg Tyr Arg Asn Arg
Leu Phe Ala Pro Ile Ser Ser Val Arg Arg Glu Ala Gly Asp Thr Val Thr Glu
ATC TTT CCG CCC TTA ACT TCT ATG GGC AGA AAG CCG CGG TAG ACA TTG CCA AAG
1575 1584 1593 1602 1611 1620
TAG AAA GGC GGG AAT TGA AGA TAC CCG TCT TTC GGC GCC ATC TGT AAC GGT TTC
*** Lys Gly Gly Asn *** Arg Tyr Pro Ser Phe Gly Ala Ile Cys Asn Gly Phe
Arg Lys Ala Gly Ile Glu Asp Thr Arg Leu Ser Ala Pro Ser Val Thr Val Ser
Glu Arg Arg Glu Leu Lys Ile Pro Val Phe Arg Arg His Leu *** Arg Phe Leu

FIG. 2f


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Leu Arg Pro Thr Gly Phe Ile Thr Lys Glu Pro Pro His Lys Trp Ser Pro Gln
Phe Ala Pro His Val Leu Tyr Pro Arg Arg Arg Leu Ile Asn Gly Leu His Ser
Ser Pro Pro Thr Tyr Trp Ile His Asp Glu Gly Ser Ser Thr Glu Leu Ile Ala
-----
ACT TCC GCC CCA CAT GGT TTA TAC CAG AAG AGG CCT CCT ACA AAG GTT CTA CCG
1629      1638      1647      1656      1665      1674
TGA AGG CCG GGT GTA CCA AAT ATG GTC TTC TCC GGA GGA TGT TTC CAA GAT GGC
-----
*** Arg Arg Gly Val Pro Asn Met Val Phe Ser Gly Gly Cys Phe Gln Asp Gly
Glu Gly Gly Val Tyr Gln Ile Trp Ser Ser Pro Glu Asp Val Ser Lys Met Ala
Lys Ala Gly Cys Thr Lys Tyr Gly Leu Leu Arg Arg Met Phe Pro Arg Trp Leu

Pro Pro Pro Asp Thr Lys Gln Pro Leu Ala Glu Lys Ala Val Asp Asp *** Leu
Arg Pro Arg Thr Arg Arg Arg Arg Tyr Arg Arg Arg Pro Trp Thr Met Arg Tyr
Ala Pro Ala Pro Gly Asp Glu Ala Thr Val Gly Gly Gln Gly Arg *** Gly Ile
-----
ACG CCC CCG CCC AGG CAG AAG ACG CCA TTG CCG AGG AAC CCG TGC AGT AGG ATA
1683      1692      1701      1710      1719      1728
TGC GGG GGC GGG TCC GTC TTC TGC GGT AAC GCC TCC TTG GCC ACG TCA TCC TAT
-----
Cys Gly Gly Gly Ser Val Phe Cys Gly Asn Ala Ser Leu Ala Thr Ser Ser Tyr
Ala Gly Ala Gly Pro Ser Ser Ala Val Thr Pro Pro Trp Pro Arg His Pro Ile
Arg Gly Arg Val Arg Leu Leu Arg *** Arg Leu Leu Gly His Val Ile Leu ***

Leu Ser Leu Leu Ala Ser Ser Tyr Tyr
Phe His Phe Phe His Ala Ala Thr Thr Asn
Phe Thr Phe Ser Thr Arg Gln Gln Leu Ile
-----
TTT TCA CTT TCT TCA CGC GAC GAC ATC ATA A 5'
1737      1746      1755
AAA AGT GAA AGA AGT GCG CTG CTG TAG TAT T 3'
-----
Lys Ser Glu Arg Ser Ala Leu Leu *** Tyr
Lys Val Lys Glu Val Arg Cys Cys Ser Ile
Lys *** Lys Lys Cys Cys Ala Ala Val Val

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FIG. 2g

Title: CIRCOVIRUS SEQUENCES ASSOCIATED
WITH PIGLET WEIGHT LOSS DISEASE (PWD)
Inventor(s): Andre JESTIN et al.
Appl. No.: Unassigned

		10	20	30	40	50	
circopormank	1	ACCAGCGCAC	TTCCGGCAGCG	GCAGCACCTC	GCCAGCGTCA	GTGAAAATGC	50
circopormeeh	1	ACCAGCGCAC	TTCCGGCAGCG	GCAGCACCTC	GCCAGCGTCA	GTGAAAATGC	50
circopordfp	1	ACCAGCGCAC	TTCCGGCAGCG	GCAGCACCTC	GCCAGCGTCA	GTGAAAATGC	50
		60	70	80	90	100	
circopormank	51	CAAGCAAGAA	AAGCGGCCCG	CAACCCCATATA	AGAGGTGGGT	GTTCAACCTT	100
circopormeeh	51	CAAGCAAGAA	AAGCGGCCCG	CAACCCCATATA	AGAGGTGGGT	GTTCAACCTT	100
circopordfp	51	CAAGCAAGAA	AAGCGGCCCG	CAACCCCATATA	AGAGGTGGGT	GTTCAACCTT	100
		110	120	130	140	150	
circopormank	101	AATAATCCTT	CCGAGGAGGA	GAAAAACAAA	ATACGGGAGC	TTCCAATCTC	150
circopormeeh	101	AATAATCCTT	CCGAGGAGGA	GAAAAACAAA	ATACGGGAGC	TTCCAATCTC	150
circopordfp	101	AATAATCCTT	CCGAGGAGGA	GAAAAACAAA	ATACGGGAGC	TTCCAATCTC	150
		160	170	180	190	200	
circopormank	151	CCTTTTGTAT	TATTTTGTAT	CGCGAGAGGA	AGGTTTGGAA	GAGGCTAGAA	200
circopormeeh	151	CCTTTTGTAT	TATTTTGTAT	CGCGAGAGGA	AGGTTTGGAA	GAGGCTAGAA	200
circopordfp	151	CCTTTTGTAT	TATTTTGTAT	CGCGAGAGGA	AGGTTTGGAA	GAGGCTAGAA	200
		210	220	230	240	250	
circopormank	201	CTCCTCACCT	CCAGGGGTTT	GGAATTTTGG	CTAAGAAGCA	GACTTTTAAC	250
circopormeeh	201	CTCCTCACCT	CCAGGGGTTT	GGAATTTTGG	CTAAGAAGCA	GACTTTTAAC	250
circopordfp	201	CTCCTCACCT	CCAGGGGTTT	GGAATTTTGG	CTAAGAAGCA	GACTTTTAAC	250
		260	270	280	290	300	
circopormank	251	AAGGTGAAGT	GGTATTTTGG	TGCCCGCTGC	CACATCGAGA	AAGCGAAAGG	300
circopormeeh	251	AAGGTGAAGT	GGTATTTTGG	TGCCCGCTGC	CACATCGAGA	AAGCGAAAGG	300
circopordfp	251	AAGGTGAAGT	GGTATTTTGG	TGCCCGCTGC	CACATCGAGA	AAGCGAAAGG	300
		310	320	330	340	350	
circopormank	301	AACCGACCAG	CAGAATAAAG	AATACTGCAG	TAAAGAAGGC	CACATACTTA	350
circopormeeh	301	AACCGACCAG	CAGAATAAAG	AATACTGCAG	TAAAGAAGGC	CACATACTTA	350
circopordfp	301	AACCGACCAG	CAGAATAAAG	AATACTGCAG	TAAAGAAGGC	CACATACTTA	350
		360	370	380	390	400	
circopormank	351	TCGAGTGTGG	AGCTCCGCGG	AACCGAGGGA	AGCGCAGCGA	CCTGTGTACT	400
circopormeeh	351	TCGAGTGTGG	AGCTCCGCGG	AACCGAGGGA	AGCGCAGCGA	CCTGTGTACT	400
circopordfp	351	TCGAGTGTGG	AGCTCCGCGG	AACCGAGGGA	AGCGCAGCGA	CCTGTGTACT	400
		410	420	430	440	450	
circopormank	401	GCTGTGAGTA	CCCTTTTGGG	GACCGGGTCT	TTGGTGACTG	TAGCCGAGCA	450
circopormeeh	401	GCTGTGAGTA	CCCTTTTGGG	GACCGGGTCT	TTGGTGACTG	TAGCCGAGCA	450
circopordfp	401	GCTGTGAGTA	CCCTTTTGGG	GACCGGGTCT	TTGGTGACTG	TAGCCGAGCA	450
		460	470	480	490	500	
circopormank	451	GTTCCCTGTA	ACGTATGTGA	GAAATTTCCG	CGGGCTGGCT	GAACTTTGA	500
circopormeeh	451	GTTCCCTGTA	ACGTATGTGA	GAAATTTCCG	CGGGCTGGCT	GAACTTTGA	500
circopordfp	451	GTTCCCTGTA	ACGTATGTGA	GAAATTTCCG	CGGGCTGGCT	GAACTTTGA	500
		510	520	530	540	550	
circopormank	501	AAGTGAGCGG	GAAGATGCAG	CAGCGTGATT	GGAAGACAGC	TGTACACGTC	550
circopormeeh	501	AAGTGAGCGG	GAAGATGCAG	CAGCGTGATT	GGAAGACAGC	TGTACACGTC	550
circopordfp	501	AAGTGAGCGG	GAAGATGCAG	CAGCGTGATT	GGAAGACAGC	TGTACACGTC	550
		560	570	580	590	600	
circopormank	551	ATAGTGGGCC	CGCCCGGTTG	TGGGAAGAGC	CAGTGGGCCC	GTAATTTTGC	600
circopormeeh	551	ATAGTGGGCC	CGCCCGGTTG	TGGGAAGAGC	CAGTGGGCCC	GTAATTTTGC	600
circopordfp	551	ATAGTGGGCC	CGCCCGGTTG	TGGGAAGAGC	CAGTGGGCCC	GTAATTTTGC	600

FIG. 3a

Title: CIRCOVIRUS SEQUENCES ASSOCIATED
WITH PIGLET WEIGHT LOSS DISEASE (PWD)
Inventor(s): Andre JESTIN et al.
Appl. No.: Unassigned

circopormank	601	610	620	630	640	650	
circopormeeh	601	TGAGCCTAGG	GACACCTACT	GGAAGCCTAG	TAGAAATAAG	TGGTGGGATG	650
circopordfp	601	TGAGCCTAGG	GACACCTACT	GGAAGCCTAG	TAGAAATAAG	TGGTGGGATG	650
	651	660	670	680	690	700	
circopormank	651	GATATCATGG	AGAAGAAGTT	GTTGTTTTGG	ATGATTTTGA	TGACTGGTTA	700
circopormeeh	651	GATATCATGG	AGAAGAAGTT	GTTGTTTTGG	ATGATTTTGA	TGACTGGTTA	700
circopordfp	651	GATATCATGG	AGAAGAAGTT	GTTGTTTTGG	ATGATTTTGA	TGACTGGTTA	700
	701	710	720	730	740	750	
circopormank	701	CCTTGGGATG	ATCTACTGAG	ACTGTGTGAC	CGGTATCCAT	TGACTGTAGA	750
circopormeeh	701	CCTTGGGATG	ATCTACTGAG	ACTGTGTGAC	CGGTATCCAT	TGACTGTAGA	750
circopordfp	701	CCTTGGGATG	ATCTACTGAG	ACTGTGTGAC	CGGTATCCAT	TGACTGTAGA	750
	751	760	770	780	790	800	
circopormank	751	GACTAAAGGC	GGTACTGTTT	CTTTTTTGGC	TGGCAGTATT	TGATTACCA	800
circopormeeh	751	GACTAAAGGC	GGTACTGTTT	CTTTTTTGGC	TGGCAGTATT	TGATTACCA	800
circopordfp	751	GACTAAAGGC	GGTACTGTTT	CTTTTTTGGC	TGGCAGTATT	TGATTACCA	800
	801	810	820	830	840	850	
circopormank	801	GCAATCAGGC	CCCCCAGGAA	TGGTACTCCT	CAACTGCTGT	CCCAGGTGTA	850
circopormeeh	801	GCAATCAGGC	CCCCCAGGAA	TGGTACTCCT	CAACTGCTGT	CCCAGGTGTA	850
circopordfp	801	GCAATCAGGC	CCCCCAGGAA	TGGTACTCCT	CAACTGCTGT	CCCAGGTGTA	850
	851	860	870	880	890	900	
circopormank	851	GAAGCTCTCT	ATCGGAGGAT	TACTACTTTG	CAATTTTGGG	AGACTGCTGG	900
circopormeeh	851	GAAGCTCTCT	ATCGGAGGAT	TACTACTTTG	CAATTTTGGG	AGACTGCTGG	900
circopordfp	851	GAAGCTCTCT	ATCGGAGGAT	TACTACTTTG	CAATTTTGGG	AGACTGCTGG	900
	901	910	920	930	940	950	
circopormank	901	AGAACAATCA	ACGGAGGTAC	CCGAAGGCCG	ATTGAAGCA	GTGGAGCCAC	950
circopormeeh	901	AGAACAATCC	ACGGAGGTAC	CCGAAGGCCG	ATTGAAGCA	GTGGAGCCAC	950
circopordfp	901	AGAACAATCC	ACGGAGGTAC	CCGAAGGCCG	ATTGAAGCA	GTGGAGCCAC	950
	951	960	970	980	990	1000	
circopormank	951	CCTGTGCCCT	TTTCCCATAT	AAAATAAATT	ACTGAGTCTT	TTTGTATTAT	1000
circopormeeh	951	CCTGTGCCCT	TTTCCCATAT	AAAATAAATT	ACTGAGTCTT	TTTGTATTAT	1000
circopordfp	951	CCTGTGCCCT	TTTCCCATAT	AAAATAAATT	ACTGAGTCTT	TTTGTATTAT	1000
	1001	1010	1020	1030	1040	1050	
circopormank	1001	ACATCGTAAT	GGTTTTTATT	TTTATTTATT	TAGAGGGTCT	TTTAGGATAA	1050
circopormeeh	1001	ACATCGTAAT	GGTTTTTATT	TTTATTTATT	TAGAGGGTCT	TTTAGGATAA	1050
circopordfp	1001	ACATCGTAAT	GGTTTTTATT	TTTATTTATT	TAGAGGGTCT	TTTAGGATAA	1050
	1051	1060	1070	1080	1090	1100	
circopormank	1051	ATTCTCTGAA	TTGTACATAA	ATAGTCAGCC	TTACCACATA	ATTTTGGGCT	1100
circopormeeh	1051	ATTCTCTGAA	TTGTACATAA	ATAGTCAGCC	TTACCACATA	ATTTTGGGCT	1100
circopordfp	1051	ATTCTCTGAA	TTGTACATAA	ATAGTCAGCC	TTACCACATA	ATTTTGGGCT	1100
	1101	1110	1120	1130	1140	1150	
circopormank	1101	GTGGCTGCAT	TTTGGAGCGC	ATAGCCGAGG	CCTGTGTGCT	CGACATTGGT	1150
circopormeeh	1101	GTGGCTGCAT	TTTGGAGCGC	ATAGCCGAGG	CCTGTGTGCT	CGACATTGGT	1150
circopordfp	1101	GTGGCTGCAT	TTTGGAGCGC	ATAGCCGAGG	CCTGTGTGCT	CGACATTGGT	1150
	1151	1160	1170	1180	1190	1200	
circopormank	1151	GTGGGTATTT	AAATGGAGCC	ACAGCTGGTT	TCTTTTATTA	TTTGGGTGGA	1200
circopormeeh	1151	GTGGGTATTT	AAATGGAGCC	ACAGCTGGTT	TCTTTTATTA	TTTGGGTGGA	1200
circopordfp	1151	GTGGGTATTT	AAATGGAGCC	ACAGCTGGTT	TCTTTTATTA	TTTGGGTGGA	1200

FIG. 3b

Title: CIRCOVIRUS SEQUENCES ASSOCIATED
WITH PIGLET WEIGHT LOSS DISEASE (PWD)
Inventor(s): Andre JESTIN et al.
Appl. No.: Unassigned

		1210	1220	1230	1240	1250	
circopormank	1201	ACCAATCAAT	TGTTTGGTCC	AGCTCAGGTT	TGGGGGTGAA	GTACCTGGAG	1250
circopormeeh	1201	ACCAATCAAT	TGTTTGGTCC	AGCTCAGGTT	TGGGGGTGAA	GTACCTGGAG	1250
circopordfp	1201	ACCAATCAAT	TGTTTGGTCT	AGCTCTGGTT	TGGGGGTGAA	GTACCTGGAG	1250
		1260	1270	1280	1290	1300	
circopormank	1251	TGGTAGGTAA	AGGGCTGCCT	TATGCTGTGG	CGGCAGGAGT	AGTTAATATA	1300
circopormeeh	1251	TGGTAGGTAA	AGGGCTGCCT	TATGCTGTGG	CGGCAGGAGT	AGTTAATATA	1300
circopordfp	1251	TGGTAGGTAA	AGGGCTGCCT	TATGCTGTGG	CGGCAGGAGT	AGTTAATATA	1300
		1310	1320	1330	1340	1350	
circopormank	1301	GGGGTCATAG	GCCAAAGTTG	TGGAGCGGGT	TACAAAGTTG	GCATCCAAGA	1350
circopormeeh	1301	GGGGTCATAG	GCCAAAGTTG	TGGAGCGGGT	TACAAAGTTG	GCATCCAAGA	1350
circopordfp	1301	GGGGTCATAG	GCCAAAGTTG	TGGAGCGGGT	TACAAAGTTG	GCATCCAAGA	1350
		1360	1370	1380	1390	1400	
circopormank	1351	TAACAACAGT	GGACCCAACA	CCCTTTTGAT	TAGAGGTGAT	GGGGTCTCTG	1400
circopormeeh	1351	TAACAACAGT	GGACCCAACA	CCCTTTTGAT	TAGAGGTGAT	GGGGTCTCTG	1400
circopordfp	1351	TAACAACAGT	GGACCCAACA	CCCTTTTGAT	TAGAGGTGAT	GGGGTCTCTG	1400
		1410	1420	1430	1440	1450	
circopormank	1401	GGGTAAAATT	CATATTTAGC	CTTCTAATA	CGGTAGTATT	GGAAAGGTAG	1450
circopormeeh	1401	GGGTAAAATT	CATATTTAGC	CTTCTAATA	CGGTAGTATT	GGAAAGGTAG	1450
circopordfp	1401	GGGTAAAATT	CATATTTAGC	CTTCTAATA	CGGTAGTATT	GGAAAGGTAG	1450
		1460	1470	1480	1490	1500	
circopormank	1451	GGGTAGCGGG	TTGGTGCCGC	CTGAGCGCGG	GAGGAACCTG	CCGATGTTGA	1500
circopormeeh	1451	GGGTAGCGGG	TTGGTGCCGC	CTGAGCGCGG	GAGGAACCTG	CCGATGTTGA	1500
circopordfp	1451	GGGTAGCGGG	TTGGTGCCGC	CTGAGCGCGG	GAGGAACCTG	CCGATGTTGA	1500
		1510	1520	1530	1540	1550	
circopormank	1501	ATCTGAGGTC	GTTAACAATC	CAAGATGGCT	GGCAGTATCC	TGCTTTTATG	1550
circopormeeh	1501	ATCTGAGGTC	GTTAACAATC	CAAGATGGCT	GGCAGTATCC	TGCTTTTATG	1550
circopordfp	1501	ATCTGAGGTC	GTTAACAATC	CAAGATGGCT	GGCAGTATCC	TGCTTTTATG	1550
		1560	1570	1580	1590	1600	
circopormank	1551	GTGAGTACAA	ATTCTCTAGA	AAGGCGGGAA	TTGAAGATAC	CCGTCTTTTC	1600
circopormeeh	1551	GTGAGTACAA	ATTCTCTAGA	AAGGCGGGAA	TTGAAGATAC	CCGTCTTTTC	1600
circopordfp	1551	GTGAGTACAA	ATTCTCTAGA	AAGGCGGGAA	TTGAAGATAC	CCGTCTTTTC	1600
		1610	1620	1630	1640	1650	
circopormank	1601	GGGCCATCTG	TAACGGTTTC	TGAAGCGCGG	GTGTGCCAAA	TATGGTCTTC	1650
circopormeeh	1601	GGGCCATCTG	TAACGGTTTC	TGAAGCGCGG	GTGTGCCAAA	TATGGTCTTC	1650
circopordfp	1601	GGGCCATCTG	TAACGGTTTC	TGAAGCGCGG	GTGTGCCAAA	TATGGTCTTC	1650
		1660	1670	1680	1690	1700	
circopormank	1651	TCCGGAGGAT	GTTTCCAAGA	TGGCTGCCGG	GGCGGTTGCT	TCTTCTGCGG	1700
circopormeeh	1651	TCCGGAGGAT	GTTTCCAAGA	TGGCTGCCGG	GGCGGTTGCT	TCTTCTGCGG	1700
circopordfp	1651	TCCGGAGGAT	GTTTCCAAGA	TGGCTGCCGG	GGCGGTTGCT	TCTTCTGCGG	1700
		1710	1720	1730	1740	1750	
circopormank	1701	TAACGCCTCC	TTGGCCACGT	CATCCTATAA	AAGTGAAGA	AGTGGCGTGC	1750
circopormeeh	1701	TAACGCCTCC	TTGGCCACGT	CATCCTATAA	AAGTGAAGA	AGTGGCGTGC	1750
circopordfp	1701	TAACGCCTCC	TTGGCCACGT	CATCCTATAA	AAGTGAAGA	AGTGGCGTGC	1750
		1760	1770	1780	1790	1800	
circopormank	1751	TGTAGTATT	.....	.....	.....	.....	1800
circopormeeh	1751	TGTAGTATT	.....	.....	.....	.....	1800
circopordfp	1751	TGTAGTATT	.....	.....	.....	.....	1800

FIG. 3c

		10	20	30	40	50	
circopormank	1	NPSKKSGPOP	HKRWVFTLNN	PSEEEKNKIR	ELPISLEDFY	VCGEEGLEEG	50
circopormeeh	1	NPSKKSGPOP	HKRWVFTLNN	PSEEEKNKIR	ELPISLEDFY	VCGEEGLEEG	50
circopordfp[	1	NPSKKSGPOP	HKRWVFTLNN	PSEEEKNKIR	ELPISLEDFY	VCGEEGLEEG	50
		60	70	80	90	100	
circopormank	51	RTAHLQGFAN	FAKKOTFNKV	KWYFGARCHI	EKAKGTDQON	KEYCSKEGHI	100
circopormeeh	51	RTPHLOGFAN	FAKKOTFNKV	KWYFGARCHI	EKAKGTDQON	KEYCSKEGHI	100
circopordfp[	51	RTPHLOGFAN	FAKKOTFNKV	KWYFGARCHI	EKAKGTDQON	KEYCSKEGHI	100
		110	120	130	140	150	
circopormank	101	LIECGAPRNO	GKRSDELSTAV	STLEETGSLV	TVAEQFPVY	VRNFRGLAEL	150
circopormeeh	101	LIECGAPRNO	GKRSDELSTAV	STLEETGSLV	TVAEQFPVY	VRNFRGLAEL	150
circopordfp[	101	LIECGAPRNO	GKRSDELSTAV	STLEETGSLV	TVAEQFPVY	VRNFRGLAEL	150
		160	170	180	190	200	
circopormank	151	LKVSQKMOOR	DWKTAVHVIV	GPPGCGKSOW	ARNFAEPSOT	YWKPSRNKWH	200
circopormeeh	151	LKVSQKMOOR	DWKTAVHVIV	GPPGCGKSOW	ARNFAEPSOT	YWKPSRNKWH	200
circopordfp[	151	LKVSQKMOOR	DWKTAVHVIV	GPPGCGKSOW	ARNFAEPSOT	YWKPSRNKWH	200
		210	220	230	240	250	
circopormank	201	DGYHGEEVVV	LDDFYGWLFW	DDLRLCDRY	PLTVETKGGT	VPFLARSILI	250
circopormeeh	201	DGYHGEEVVV	LDDFYGWLFW	DDLRLCDRY	PLTVETKGGT	VPFLARSILI	250
circopordfp[	201	DGYHGEEVVV	LDDFYGWLFW	DDLRLCDRY	PLTVETKGGT	VPFLARSILI	250
		260	270	280	290	300	
circopormank	251	TSNOAPOEWY	SSTAVPAVEA	LYRRITTLQF	WKTAGEOSTE	VPEGRFEAVD	300
circopormeeh	251	TSNOAPOEWY	SSTAVPAVEA	LYRRITTLQF	WKTAGEOSTE	VPEGRFEAVD	300
circopordfp[	251	TSNOAPOEWY	SSTAVPAVEA	LYRRITTLQF	WKTAGEOSTE	VPEGRFEAVD	300
		310	320	330	340	350	
circopormank	301	PPCALFPYKI	NY	.....	.....	.....	350
circopormeeh	301	PPCALFPYKI	NY	.....	.....	.....	350
circopordfp[	301	PPCALFPYKI	NY	.....	.....	.....	350

FIG. 4

		10	20	30	40	50	
circopormank	1	MTWPRRRYRR	RRTRPRSHLG	NILRRRPYLA	HPAFRRRYRW	RRKTGIFNCR	50
circopormeeh	1	MTWPRRRYRR	RRTRPRSHLG	NILRRRPYLA	HPAFRRRYRW	RRKTGIFNSR	50
circopordfp	1	MTWPRRRYRR	RRTRPRSHLG	NILRRRPYL	HPAFRRRYRW	RRKTGIFNSR	50
		60	70	80	90	100	
circopormank	51	LSKEFVLTIR	GGYSOPSWNV	NILRFNIGOF	LPPSGGTNPL	PLPFOYYRIR	100
circopormeeh	51	LSKEFVLTIR	GGYSOPSWNV	NILRFNIGOF	LPPSGGTNPL	PLPFOYYRIR	100
circopordfp	51	LSKEFVLTIR	GGYSOPSWNV	NILRFNIGOF	LPPSGGTNPL	PLPFOYYRIR	100
		110	120	130	140	150	
circopormank	101	KAKYEFYPRD	PITSNERGVG	STVVILDANF	VTPSTNLAYD	PYINYSSRHT	150
circopormeeh	101	KAKYEFYPRD	PITSNERGVG	STVVILDANF	VTPSTNLAYD	PYINYSSRHT	150
circopordfp	101	KAKYEFYPRD	PITSNERGVG	STVVILDANF	VTPSTNLAYD	PYINYSSRHT	150
		160	170	180	190	200	
circopormank	151	IRPPFTYHSR	YFTPKPELDO	TIDWFHPNNK	RNQLWEHLNT	HTNVEHTGLG	200
circopormeeh	151	IRPPFTYHSR	YFTPKPELDO	TIDWFHPNNK	RNQLWEHLNT	HTNVEHTGLG	200
circopordfp	151	IRPPFTYHSR	YFTPKPELDO	TIDWFHPNNK	RNQLWEHLNT	HTNVEHTGLG	200
		210	220	230	240	250	
circopormank	201	YALONAATAQ	NYVVRLLTIYV	OFREFILKDP	LNK*	.....	250
circopormeeh	201	YALONAATAQ	NYVVRLLTIYV	OFREFILKDP	LNK*	.....	250
circopordfp	201	YALONAATAQ	NYVVRLLTIYV	OFREFILKDP	LNK*	.....	250

FIG. 5

		10	20	30	40	50	
circopormank	1	MISIPPLIST	RLPVGVRLS	KITGPEALPT	TGRAHYDVYS	CLPITLLHLP	50
circopormeeh	1	MISIPPLIST	RLPVGVRLS	KITGPEALPT	TGRAHYDVYS	CLPITLLHLP	50
circopordfp	1	MISIPPLIST	RLPVGVRLS	KITGPEALPT	TGRAHYDVYS	CLPITLLHLP	50
		60	70	80	90	100	
circopormank	51	AHFQKFSOPA	EISHIRYREL	LGYSHORPRE	OKGTHSSROV	AALPLVPRSS	100
circopormeeh	51	AHFQKFSOPA	EISHIRYREL	LGYSHORPRE	OKGTHSSROV	AALPLVPRSS	100
circopordfp	51	AHFQKFSOPA	EISHIRYREL	LGYSHORPRE	OKGTHSSROV	AALPLVPRSS	100
		110	120	130	140	150	
circopormank	101	TLDKYVAFFT	AVFFILLVGS	FRFLDVAAGT	KIPLHLVKSL	LLSKIRKPLE	150
circopormeeh	101	TLDKYVAFFT	AVFFILLVGS	FRFLDVAAGT	KIPLHLVKSL	LLSKIRKPLE	150
circopordfp	101	TLDKYVAFFT	AVFFILLVGS	FRFLDVAAGT	KIPLHLVKSL	LLSKIRKPLE	150
		160	170	180	190	200	
circopormank	151	VSSSTLEQTE	LSANKLIKKG	DWKLPYFVFL	LLGRIIKGEH	PPLMGLRAAF	200
circopormeeh	151	VSSSTLEQTE	LSANKLIKKG	DWKLPYFVFL	LLGRIIKGEH	PPLMGLRAAF	200
circopordfp	151	VSSSTLEQTE	LSANKLIKKG	DWKLPYFVFL	LLGRIIKGEH	PPLMGLRAAF	200
		210	220	230	240	250	
circopormank	201	LAWHEH*	.....	.....	.....	.....	250
circopormeeh	201	LAWHEH*	.....	.....	.....	.....	250
circopordfp	201	LAWHEH*	.....	.....	.....	.....	250

FIG. 6

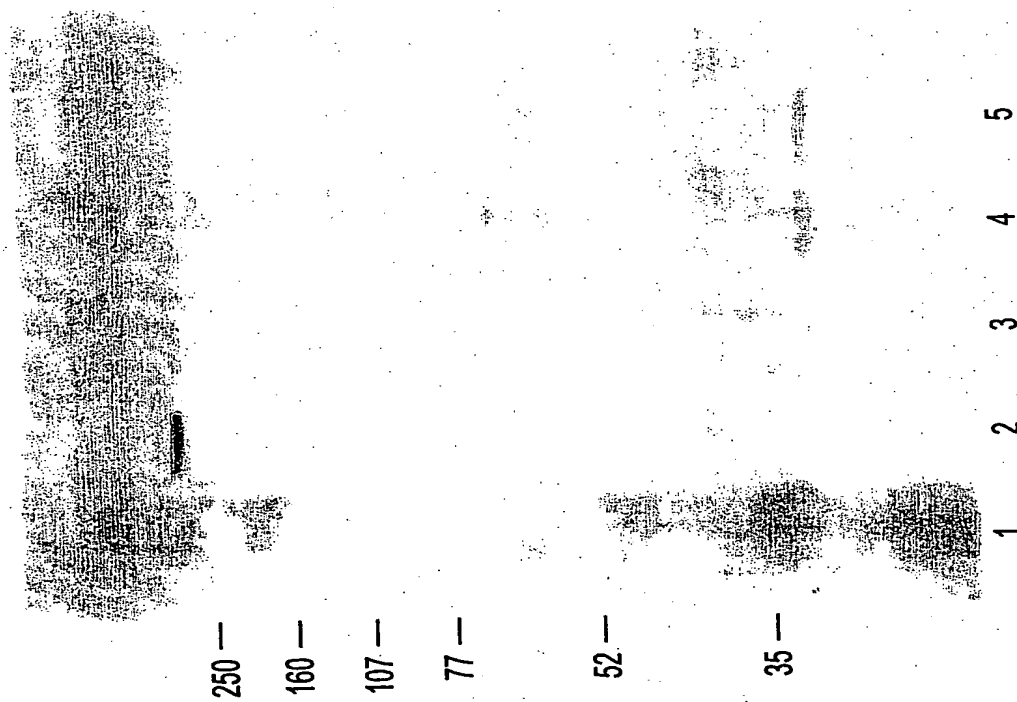


FIG. 7

Leu Ala Ser Arg Cys Arg Cys Cys Arg Pro Leu Val Glu Ala Ala Val His Gly
Trp Arg Val Glu Ala Ala Ala Ala Gly Arg Cys Cys Arg Leu Leu Leu Met Gly
Gly Ala Cys Lys Pro Leu Pro Leu Val Glu Ala Ala Gly *** Cys Cys Cys Ala
3' TGG TCG CGT GAA GCC GTC GCC GTC GTG GAG CCG TCG TGG AGT CGT CGT TGT ACG
9 18 27 36 45 54
5' ACC AGC GCA CTT CGG CAG CGG CAG CAC CTC GGC AGC ACC TCA GCA GCA ACA TGC
Thr Ser Ala Leu Arg Gln Arg Gln His Leu Gly Ser Thr Ser Ala Ala Thr Cys
Pro Ala His Phe Gly Ser Gly Ser Thr Ser Ala Ala Pro Gln Gln Gln His Ala
Gln Arg Thr Ser Ala Ala Ala Ala Pro Arg Gln His Leu Ser Ser Asn Met Pro
Ala Leu Leu Ile Ser Ser Ala Ser Gly Leu Gly Met Phe Pro Pro His Glu Ser
Leu Leu Phe Phe Pro Leu Leu Pro Gly Trp Gly Trp Leu Leu His Thr Asn Val
Trp Cys Ser Ser His Phe Phe Arg Val Gly Val Gly Tyr Phe Thr Pro Thr ***
GGT CGT TCT TCT TAC CTT CTT CGC CTG GGG TTG GGG TAT TTT CCA CCC ACA AGT
63 72 81 90 99 108
CCA GCA AGA AGA ATG GAA GAA GCG GAC CCC AAC CCC ATA AAA GGT GGG TGT TCA
Pro Ala Arg Arg Met Glu Glu Ala Asp Pro Asn Pro Ile Lys Gly Gly Cys Ser
Gln Gln Glu Glu Trp Lys Lys Arg Thr Pro Thr Pro *** Lys Val Gly Val His
Ser Lys Lys Asn Gly Arg Ser Gly Pro Gln Pro His Lys Arg Trp Val Phe Thr
Gln Ile Ile Arg Gly Phe Val Leu Ala Leu Phe Tyr Pro Ile Lys Trp Tyr Gly
Arg Phe Leu Gly Glu Ser Ser Ser Arg Leu Phe Ile Arg Ser Arg Gly Ile Asp
Glu Ser Tyr Asp Lys Arg Leu Arg Ala Cys Ser Phe Val Pro Asp Glu Leu Ile
GAG ACT TAT TAG GAA GGC TTC TGC TCG CGT TCT TTT ATG CCC TAG AAG GTT ATA
117 126 135 144 153 162
CTC TGA ATA ATC CTT CCG AAG ACG AGC GCA AGA AAA TAC GGG ATC TTC CAA TAT
Leu *** Ile Ile Leu Pro Lys Thr Ser Ala Arg Lys Tyr Gly Ile Phe Gln Tyr
Ser Glu *** Ser Phe Arg Arg Arg Ala Gln Glu Asn Thr Gly Ser Ser Asn Ile
Leu Asn Asn Pro Ser Glu Asp Glu Arg Lys Lys Ile Arg Asp Leu Pro Ile Ser
*** Lys Ile Ile Lys Asn Asn Ala Leu Leu Thr Ile Leu Phe Ser Ser Cys Arg
Arg Ash Ser *** Lys Ile Thr Pro Ser Ser Pro Leu Ser Ser Pro Arg Val Gly
Gly Ile Gln Asn Asn *** Gln Gln Arg Pro Pro Tyr His Pro Leu Val Phe Val
GGG ATA AAC TAA TAA AAT AAC AAC CGC TCC TCC CAT TAC TCC TTC CTG CTT GTG
171 180 189 198 207 216
CCC TAT TTG ATT ATT TTA TTG TTG GCG AGG AGG GTA ATG AGG AAG GAC GAA CAC
Pro Tyr Leu Ile Ile Leu Leu Leu Ala Arg Arg Val Met Arg Lys Asp Glu His
Pro Ile *** Leu Phe Tyr Cys Trp Arg Gly Gly *** *** Gly Arg Thr Asn Thr
Leu Phe Asp Tyr Phe Ile Val Gly Glu Glu Gly Asn Glu Glu Gly Arg Thr Pro
Val Glu Leu Pro Glu Ser Ile Lys His Leu Leu Leu Ser Lys Ile Phe His Leu
*** Arg Trp Pro Asn Ala Leu Lys Thr Phe Phe Cys Val Lys Leu Leu Thr Phe
Glu Gly Gly Pro Thr Arg *** Asn Gln Ser Ser Ala Ser Lys *** Tyr Leu Ser
GAG TGG AGG TCC CCA AGC GAT TAA AAC ACT TCT TCG TCT GAA AAT TAT TTC ACT
225 234 243 252 261 270
CTC ACC TCC AGG GGT TCG CTA ATT TTG TGA AGA AGC AGA CTT TTA ATA AAG TGA
Leu Thr Ser Arg Gly Ser Leu Ile Leu *** Arg Ser Arg Leu Leu Ile Lys ***
Ser Pro Pro Gly Val Arg *** Phe Cys Glu Glu Ala Asp Phe *** *** Ser Glu
His Leu Gln Gly Phe Ala Asn Phe Val Lys Lys Gln Thr Phe Asn Lys Val Lys

FIG. 8a


```

Pro Ile Gln Thr Gly Ala Ala Val Asp Leu Phe Arg Phe Ser Cys Ile Leu Leu
His Tyr Lys Pro Ala Arg Gln Trp Met Ser Phe Ala Phe Pro Val Ser *** Cys
Thr Thr Asn Pro His Gly Ser Gly Cys Arg Ser Leu Ser Leu Phe Leu Asp Ala
TCA CCA TAA ACC CAC GGG CGA CGG TGT AGC TCT TTC GCT TTC CTT GTC TAG TCG
279 288 297 306 315 324
AGT GGT ATT TGG GTG CCC GCT GCC ACA TCG AGA AAG CGA AAG GAA CAG ATC AGC
Ser Gly Ile Trp Val Pro Ala Ala Thr Ser Arg Lys Arg Lys Glu Gln Ile Ser
Val Val Phe Gly Cys Pro Leu Pro His Arg Glu Ser Glu Arg Asn Arg Ser Ala
Trp Tyr Leu Gly Ala Arg Cys His Ile Glu Lys Ala Lys Gly Thr Asp Gln Gln
Ile Phe Phe Val Ala Thr Phe Phe Ala Val *** Gln His Leu Thr Ser Ser Arg
Phe Leu Ser Tyr Gln Leu Leu Ser Pro Leu Lys Ser His Ser His Pro Ala Gly
Ser Tyr Leu Ile Ser Cys Tyr Leu Leu Cys Ser Val Ser Pro Thr His Leu Glu
TCT TAT TTC TTA TGA CGT CAT TTC TTC CGT TGA ATG ACT ACC TCA CAC CTC GAG
333 342 351 360 369 378
AGA ATA AAG AAT ACT GCA GTA AAG AAG GCA ACT TAC TGA TGG AGT GTG GAG CTC
Arg Ile Lys Asn Thr Ala Val Lys Lys Ala Thr Tyr *** Trp Ser Val Glu Leu
Glu *** Arg Ile Leu Gln *** Arg Arg Gln Leu Thr Asp Gly Val Trp Ser Ser
Asn Lys Glu Tyr Cys Ser Lys Glu Gly Asn Leu Leu Met Glu Cys Gly Ala Pro
Ser Arg Leu Ser Leu Pro Thr Val Gln Arg Ser Ser His Thr Gly Gln Gln Leu
Leu Asp *** Pro Cys Arg Leu Ser Arg Asp Val Ala Thr Leu Val Lys Asn Ser
*** Ile Glu Pro Val Val Ser His Gly Thr *** Gln Gln Ser Tyr Arg Thr Pro
GAT CTA GAG TCC CTG TTG CCT CAC TGG ACA GAT GAC GAC ACT CAT GGA ACA ACC
387 396 405 414 423 432
CTA GAT CTC AGG GAC AAC GGA GTG ACC TGT CTA CTG CTG TGA GTA CCT TGT TGG
Leu Asp Leu Arg Asp Asn Gly Val Thr Cys Leu Leu Leu *** Val Pro Cys Trp
*** Ile Ser Gly Thr Thr Glu *** Pro Val Tyr Cys Cys Glu Tyr Leu Val Gly
Arg Ser Gln Gly Gln Arg Ser Asp Leu Ser Thr Ala Val Ser Thr Leu Leu Glu
Ala Pro Thr Gln His Gly Asn Cys Leu Leu Val Arg Tyr Arg Lys Asp Ser Ile
Leu Pro Leu Arg Thr Val Thr Ala Ser Cys Cys Gly Thr Val Asn Thr Leu Phe
Ser Arg Ser Asp Pro Ser Arg Gln Leu Ala Ala Gly Gln Leu Thr Gln *** Phe
TCT CGC CCT CAG ACC ACT GGC AAC GTC TCG TCG TGG GAC ATT GCA AAC AGT CTT
441 450 459 468 477 486
AGA GCG GGA GTC TGG TGA CCG TTG CAG AGC AGC ACC CTG TAA CGT TTG TCA GAA
Arg Ala Gly Val Trp *** Pro Leu Gln Ser Ser Thr Leu *** Arg Leu Ser Glu
Glu Arg Glu Ser Gly Asp Arg Cys Arg Ala Ala Pro Cys Asn Val Cys Gln Lys
Ser Gly Ser Leu Val Thr Val Ala Glu Gln His Pro Val Thr Phe Val Arg Asn
Glu Ala Pro Gln Ser Phe Lys Gln Phe His Ala Pro Phe His Leu Leu Thr Ile
Lys Arg Pro Ser Ala Ser Ser Lys Phe Thr Leu Pro Phe Ile Cys Phe Arg Ser
Asn Gly Arg Ala Pro Gln Val Lys Ser Leu Ser Arg Ser Phe Ala Ser Ala His
TAA AGG CGC CCG ACC GAC TTG AAA ACT TTC ACT CGC CCT TTT ACG TCT TCG CAC
495 504 513 522 531 540
ATT TCC GCG GGC TGG CTG AAC TTT TGA AAG TGA GCG GGA AAA TGC AGA AGC GTG
Ile Ser Ala Gly Trp Leu Asn Phe *** Lys *** Ala Gly Lys Cys Arg Ser Val
Phe Pro Arg Ala Gly *** Thr Phe Glu Ser Glu Arg Glu Asn Ala Glu Ala ***
Phe Arg Gly Leu Ala Glu Leu Leu Lys Val Ser Gly Lys Met Gln Lys Arg Asp

```

FIG. 8b

Pro Leu Ser Ile Tyr Val Asp Asn His Pro Trp Arg Pro Thr Thr Phe Ala Phe
Gln Phe Val Leu Thr Cys Thr Met Thr Pro Gly Gly Pro His Pro Leu Leu Leu
Asn Ser Ser *** His Val Arg *** Gln Pro Ala Val Gln Thr His Tyr Phe Cys
TAA CCT TCT GAT TAC ATG TGC AGT AAC ACC CCG GTG GAC CCA CAC CAT TTT CGT
549 558 567 576 585 594
ATT GGA AGA CTA ATG TAC ACG TCA TTG TGG GGC CAC CTG GGT GTG GTA AAA GCA
Ile Gly Arg Leu Met Tyr Thr Ser Leu Trp Gly His Leu Gly Val Val Lys Ala
Leu Glu Asp *** Cys Thr Arg His Cys Gly Ala Thr Trp Val Trp *** Lys Gln
Trp Lys Thr Asn Val His Val Ile Val Gly Pro Pro Gly Cys Gly Lys Ser Lys
Pro Ser Ser Ile Lys Cys Val Arg Phe Gly Cys Val Pro Phe Trp Arg Ser Val
His Ala Ala Leu Lys Ala Ser Gly Ser Val Val Tyr Gln Phe Gly Gly Leu Phe
Ile Pro Gln *** Asn Gln Leu Gly Pro Phe Trp Met Ser Ser Val Val *** Phe
TTA CCC GAC GAT TAA AAC GTC TGG GCC TTT GGT GTA TGA CCT TTG GTG GAT CTT
603 612 621 630 639 648
AAT GGG CTG CTA ATT TTG CAG ACC CGG AAA CCA CAT ACT GGA AAC CAC CTA GAA
Asn Gly Leu Leu Ile Leu Gln Thr Arg Lys Pro His Thr Gly Asn His Leu Glu
Met Gly Cys *** Phe Cys Arg Pro Gly Asn His Ile Leu Glu Thr Thr *** Lys
Trp Ala Ala Asn Phe Ala Asp Pro Glu Thr Thr Tyr Trp Lys Pro Pro Arg Asn
Leu Pro Pro Ile Thr Val Met Thr Phe Phe His Asn Asn Asn Ile Val Lys Ile
Leu His His Ser Pro *** Trp Pro Ser Ser Thr Thr Thr Ile Ser Ser Lys ***
Cys Thr Thr Pro His Asn Gly His His Leu Leu Pro Gln *** Gln His Ser Lys
TGT TCA CCA CCC TAC CAA TGG TAC CAC TTC TTC ACC AAC AAT AAC TAC TGA AAA
657 666 675 684 693 702
ACA AGT GGT GGG ATG GTT ACC ATG GTG AAG AAG TGG TTG TTA TTG ATG ACT TTT
Thr Ser Gly Gly Met Val Thr Met Val Lys Lys Trp Leu Leu Leu Met Thr Phe
Gln Val Val Gly Trp Leu Pro Trp *** Arg Ser Gly Cys Tyr *** *** Leu Leu
Lys Trp Trp Asp Gly Tyr His Gly Glu Glu Val Val Val Ile Asp Asp Phe Tyr
Ala Pro Gln Gly Pro Ile Ile *** Gln Ser Gln Thr Ile Ser Ile Trp Gln Ser
Pro Gln Ser Gly Gln Ser Ser Arg Ser Leu Ser His Ser Arg Tyr Gly Asn Val
His Ser Ala Ala Arg Pro His Asp Val Ser Val Thr His Asp Ile Asp Met Ser
TAC CGA CCG ACG GGA CCC TAC TAG ATG ACT CTG ACA CAC TAG CTA TAG GTA ACT
711 720 729 738 747 756
ATG GCT GGC TGC CCT GGG ATG ATC TAC TGA GAC TGT GTG ATC GAT ATC CAT TGA
Met Ala Gly Cys Pro Gly Met Ile Tyr *** Asp Cys Val Ile Asp Ile His ***
Trp Leu Ala Ala Leu Gly *** Ser Thr Glu Thr Val *** Ser Ile Ser Ile Asp
Gly Trp Leu Pro Trp Asp Asp Leu Leu Arg Leu Cys Asp Arg Tyr Pro Leu Thr
Tyr Leu Ser Phe Thr Ser Ser Tyr Arg Lys Gln Gly Ala Thr Asn Gln Asn Gly
Thr Ser Val Leu Pro Pro Val Thr Gly Lys Lys Ala Arg Leu Ile Arg Ile Val
Gln Leu Ser *** Leu His Phe Gln Val Lys Lys Pro Gly Cys Tyr Glu Ser ***
GAC ATC TCT GAT TTC CAC CTT GAC ATG GAA AAA ACC GGG CGT CAT AAG ACT AAT
765 774 783 792 801 810
CTG TAG AGA CTA AAG GTG GAA CTG TAC CTT TTT TGG CCC GCA GTA TTC TGA TTA
Leu *** Arg Leu Lys Val Glu Leu Tyr Leu Phe Trp Pro Ala Val Phe *** Leu
Cys Arg Asp *** Arg Trp Asn Cys Thr Phe Phe Gly Pro Gln Tyr Ser Asp Tyr
Val Glu Thr Lys Gly Gly Thr Val Pro Phe Leu Ala Arg Ser Ile Leu Ile Thr

FIG. 8c

Ala Ile Leu Gly Arg Gln Phe Pro Val Gly *** Ser Ser Asp Trp Ser Tyr Phe
Leu Leu *** Val Gly Asn Ser His Tyr Glu Glu Val Ala Thr Gly Ala Thr Ser
Trp Cys Asp Ser Gly Thr Pro Ile Thr Ser Arg Leu Gln Gln Gly Leu Gln Leu

GGT CGT TAG TCT GGG GCA ACC TTA CCA TGA GGA GTT GAC GAC AGG GTC GAC ATC
819 828 837 846 855 864
CCA GCA ATC AGA CCC CGT TGG AAT GGT ACT CCT CAA CTG CTG TCC CAG CTG TAG

Pro Ala Ile Arg Pro Arg Trp Asn Gly Thr Pro Gln Leu Leu Ser Gln Leu ***
Gln Gln Ser Asp Pro Val Gly Met Val Leu Leu Asn Cys Cys Pro Ser Cys Arg
Ser Asn Gln Thr Pro Leu Glu Trp Tyr Ser Ser Thr Ala Val Pro Ala Val Glu

Ser Lys Ile Pro Pro Asn Ser Gly Gln Tyr Lys Pro Leu Ile Ser Cys Phe Leu
Ala Arg *** Arg Leu Ile Val Glu Lys Thr Asn Gln Phe Phe Ala Val Ser Cys
Leu Glu Lys Asp Ser Ser *** Lys Arg Pro Ile Lys Ser Ser His *** Leu Val

TTC GAG AAA TAG CCT CCT AAT GAA GGA ACC ATA AAA CCT TCT TAC GAT GTC TTG
873 882 891 900 909 918
AAG CTC TTT ATC GGA GGA TTA CTT CCT TGG TAT TTT GGA AGA ATG CTA CAG AAC

Lys Leu Phe Ile Gly Gly Leu Leu Pro Trp Tyr Phe Gly Arg Met Leu Gln Asn
Ser Ser Leu Ser Glu Asp Tyr Phe Leu Gly Ile Leu Glu Glu Cys Tyr Arg Thr
Ala Leu Tyr Arg Arg Ile Thr Ser Leu Val Phe Trp Lys Asn Ala Thr Glu Gln

Gly Arg Leu Phe Pro Ala Leu Glu Asp Gly Lys Gly Gly Trp Ala Arg Phe Lys
Asp Val Ser Ser Pro Pro Trp Asn Thr Val Arg Glu Gly Gly His Gly Ser Asn
Ile Trp Pro Pro Leu Pro Gly Thr Arg *** Gly Lys Gly Gly Met Gly Gln Ile

TTA GGT GCC TCC TTC CCC CGG TCA AGC AGT GGG AAA GGG GGG GTA CGG GAC TTA
927 936 945 954 963 972
AAT CCA CGG AGG AAG GGG GCC AGT TCG TCA CCC TTT CCC CCC CAT GCC CTG AAT

Asn Pro Arg Arg Lys Gly Ala Ser Ser Ser Pro Phe Pro Pro His Ala Leu Asn
Ile His Gly Gly Arg Gly Pro Val Arg His Pro Phe Pro Pro Met Pro *** Ile
Ser Thr Glu Glu Gly Gly Gln Phe Val Thr Leu Ser Pro Pro Cys Pro Glu Phe

Trp Ile Phe Tyr Ile Val Ser Asp Lys Lys Asp Ser Arg Leu Pro Lys *** ***
Gly Tyr Ser Ile Phe *** Gln Thr Lys Lys Ile Val Glu Tyr His Asn Lys Asn
Glu Met His Phe Leu Asn Ser Leu Arg Lys *** *** Lys Thr Ile Thr Lys Ile

AAG GTA TAC TTT ATT TAA TGA CTC AGA AAA AAT AGT GAA GCA TTA CCA AAA ATA
981 990 999 1008 1017 1026
TTC CAT ATG AAA TAA ATT ACT GAG TCT TTT TTA TCA CTT CGT AAT GGT TTT TAT

Phe His Met Lys *** Ile Thr Glu Ser Phe Leu Ser Leu Arg Asn Gly Phe Tyr
Ser Ile *** Asn Lys Leu Leu Ser Leu Phe Tyr His Phe Val Met Val Phe Ile
Pro Tyr Glu Ile Asn Tyr *** Val Phe Phe Ile Thr Ser *** Trp Phe Leu Leu

Glu Asn Leu Thr Leu His Pro Thr Lys Leu Ile Leu Asn Glu Ser Asn Tyr Met
Asn Met Leu Pro *** Thr Pro Pro Arg *** Phe *** Ile Arg Gln Ile Thr Cys
Ile *** *** Pro Asn Leu Pro Pro Asp Lys Phe Asn Phe Glu Arg Phe Gln Val

ATA AGT AAT TCC CAA TTC ACC CCC CAG AAA TTT TAA TTT AAG AGA CTT AAC ATG
1035 1044 1053 1062 1071 1080
TAT TCA TTA AGG GTT AAG TGG GGG GTC TTT AAA ATT AAA TTC TCT GAA TTG TAC

Tyr Ser Leu Arg Val Lys Trp Gly Val Phe Lys Ile Lys Phe Ser Glu Leu Tyr
Ile His *** Gly Leu Ser Gly Gly Ser Leu Lys Leu Asn Ser Leu Asn Cys Thr
Phe Ile Lys Gly *** Val Gly Gly Leu *** Asn *** Ile Leu *** Ile Val His

FIG. 8d

Cys Pro *** Val Ser Ile Thr Asn Arg Thr Thr Tyr Val Thr Lys Ser Arg Leu
Val His Asn Cys Pro Tyr Gln Ile Gly Pro Arg Ile Tyr Gln Lys Arg Val Cys
Tyr Met Thr Val Arg Ile Asn Tyr Glu Gln Asp Tyr Ile Ser Asn Glu Phe Ala

TAT GTA CCA ATG TGC CTA TAA CAT AAG GAC CAG CAT ATA TGA CAA AAG CTT GCG
1089 1098 1107 1116 1125 1134
ATA CAT GGT TAC ACG GAT ATT GTA TTC CTG GTC GTA TAT ACT GTT TTC GAA CGC

Ile His Gly Tyr Thr Asp Ile Val Phe Leu Val Val Tyr Thr Val Phe Glu Arg
Tyr Met Val Thr Arg Ile Leu Tyr Ser Trp Ser Tyr Ile Leu Phe Ser Asn Ala
Thr Trp Leu His Gly Tyr Cys Ile Pro Gly Arg Ile Tyr Cys Phe Arg Thr Gln

Ala Ser Ala *** Thr Thr *** Met Glu Leu Leu Lys Tyr Asp *** Gly Cys Ser
His Arg Pro Arg Arg Pro Arg Cys Lys Trp Cys Asn Thr Thr Glu Ala Val Ala
Thr Gly Leu Gly Val His Asp Val Asn Gly Ala Thr Gln Leu Arg Leu Trp Leu

TCA CGG CTC CGG ATG CAC CAG ATG TAA AGG TCG TCA AAC ATC AGA GTC GGT GTC
1143 1152 1161 1170 1179 1188
AGT GCC GAG GCC TAC GTG GTC TAC ATT TCC AGC AGT TTG TAG TCT CAG CCA CAG

Ser Ala Glu Ala Tyr Val Val Tyr Ile Ser Ser Ser Leu *** Ser Gln Pro Gln
Val Pro Arg Pro Thr Trp Ser Thr Phe Pro Ala Val Cys Ser Leu Ser His Ser
Cys Arg Gly Leu Arg Gly Leu His Phe Gln Gln Phe Val Val Ser Ala Thr Ala

Thr Glu Lys Thr Thr Gln Asn Ser Thr Ile Leu Leu Ser Ile *** Ser Leu Asn
Pro Lys Lys Gln Gln Lys Thr Pro Leu Leu *** Tyr His Phe Arg Pro Cys Thr
Gln Asn Arg Lys Asn Asn Pro Gln Phe Tyr Asp Ile Thr Phe Asp Leu Val Pro

GAC CAA AGA AAA CAA CAA ACC AAC CTT CAT TAG TTA TCA CTT TAG ATC CTG TCC
1197 1206 1215 1224 1233 1242
CTG GTT TCT TTT GTT GTT TGG TTG GAA GTA ATC AAT AGT GAA ATC TAG GAC AGG

Leu Val Ser Phe Val Val Trp Leu Glu Val Ile Asn Ser Glu Ile *** Asp Arg
Trp Phe Leu Leu Leu Phe Gly Trp Lys *** Ser Ile Val Lys Ser Arg Thr Gly
Gly Phe Phe Cys Cys Leu Val Gly Ser Asn Gln *** *** Asn Leu Gly Gln Val

Pro Pro Leu Thr Gly Pro Thr Thr Pro Ser Pro Ser Pro *** Pro Ile Ala Pro
Gln Pro Tyr Leu Val Pro Leu Pro Leu Leu Ala Pro Asn His Tyr Pro Pro
Lys Pro Thr Phe Tyr Arg Ser His Tyr Ser Phe Pro Gln Thr Ile Thr His Arg

AAA CCC CCA TTT CAT GGC CCT CAC CAT CCT CTT CCC GAC CCA ATA CCA TAC CGC
1251 1260 1269 1278 1287 1296
TTT GGG GGT AAA GTA CCG GGA GTG GTA GGA GAA GGG CTG GGT TAT GGT ATG GCG

Phe Gly Gly Lys Val Pro Gly Val Val Gly Glu Gly Leu Gly Tyr Gly Met Ala
Leu Gly Val Lys Tyr Arg Glu Trp *** Glu Lys Gly Trp Val Met Val Trp Arg
Trp Gly *** Ser Thr Gly Ser Gly Arg Arg Arg Ala Gly Leu Trp Tyr Gly Gly

Pro Thr Thr *** Met Pro Thr Met Pro Ser Pro Gln Pro Arg Gln *** Leu Thr
Leu Leu Leu Lys Cys Leu Pro *** Leu His Pro Ser His Gly Lys Asn Cys Leu
Ser Ser Tyr Asn Val Tyr Pro Asp Tyr Thr Leu Ala Thr Ala Lys Thr Val Phe

CCT CCT CAT CAA ATG TAT CCC CAG TAT CCA CTC CCG ACA CCG GAA ACA ATG TTT
1305 1314 1323 1332 1341 1350
GGA GGA GTA GTT TAC ATA GGG GTC ATA GGT GAG GGC TGT GGC CTT TGT TAC AAA

Gly Gly Val Val Tyr Ile Gly Val Ile Gly Glu Gly Cys Gly Leu Cys Tyr Lys
Glu Glu *** Phe Thr *** Gly Ser *** Val Arg Ala Val Ala Phe Val Thr Lys
Arg Ser Ser Leu His Arg Gly His Arg *** Gly Leu Trp Pro Leu Leu Gln Ser

FIG. 8e

```

Ile Met *** Phe Leu Leu Val Pro Ala Trp Glu Gly Thr Val Arg Pro Ser Arg
*** *** Arg Phe Tyr Cys Cys Gln Leu Gly Ser Gly Gln *** Gly Pro His Asp
Asn Asp Asp Leu Ile Val Ala Ser Ser Gly Val Gly Arg Asp Gly Gln Thr Ile
---
CAA TAG TAG ATT TTA TTG TCG TGA CCT CGG GTG AGG GGA CAG TGG GAC CCA CTA
1359 1368 1377 1386 1395 1404
GTT ATC ATC TAA AAT AAC AGC ACT GGA GCC CAC TCC CCT GTC ACC CTG GGT GAT
---
Val Ile Ile *** Asn Asn Ser Thr Gly Ala His Ser Pro Val Thr Leu Gly Asp
Leu Ser Ser Lys Ile Thr Ala Leu Glu Pro Thr Pro Leu Ser Pro Trp Val Ile
Tyr His Leu Lys *** Gln His Trp Ser Pro Leu Pro Cys His Pro Gly *** Ser
---
Pro Ala Pro Gly Ser Asn Leu Arg Leu Arg Glu *** Glu Thr Thr Asn Leu Pro
Pro Leu Leu Ala Leu Ile *** Gly *** Gly Lys Lys Asn Gln Leu Ile *** Leu
Pro Ser Cys Pro Trp Phe Glu Val Lys Val Lys Arg Ile Arg Tyr Tyr Glu Phe
---
GCC CCT CGT CCC GGT CTT AAG TTG GAA TTG GAA AGA ATA AGA CAT CAT AAG TTT
1413 1422 1431 1440 1449 1458
CGG GGA GCA GGG CCA GAA TTC AAC CTT AAC CTT TCT TAT TCT GTA GTA TTC AAA
---
Arg Gly Ala Gly Pro Glu Phe Asn Leu Asn Leu Ser Tyr Ser Val Val Phe Lys
Gly Glu Gln Gly Gln Asn Ser Thr Leu Thr Phe Leu Ile Leu *** Tyr Ser Lys
Gly Ser Arg Ala Arg Ile Gln Pro *** Pro Phe Leu Phe Cys Ser Ile Gln Arg
---
Cys Leu Ala Pro Thr Gln Gly Gly Glu Gln Pro Phe Phe Thr Met Leu Ile Ser
Ala Cys Leu Pro Pro Lys Val Gly Arg Arg Pro Ser Ser Leu *** *** Tyr Gln
Pro Val Ser Arg Pro Asn Ser Gly Gly Gly Pro Pro Leu Phe Asp Asn Ile Asn
---
CCC GTG TCT CGC CCC CAA ACT GGG GGG AGG ACC CCC TTC TTT CAG TAA TTA TAA
1467 1476 1485 1494 1503 1512
GGG CAC ACA GCG GGG GTT TGA CCC CCC TCC TGG GGG AGG AAA GTC ATT AAT ATT
---
Gly His Arg Ala Gly Val *** Pro Pro Ser Trp Gly Lys Lys Val Ile Asn Ile
Gly Thr Glu Arg Gly Phe Asp Pro Pro Pro Gly Gly Arg Lys Ser Leu Ile Leu
Ala Gln Ser Gly Gly Leu Thr Pro Leu Leu Gly Glu Glu Ser His *** Tyr ***
---
Asp *** *** Thr Trp Arg Gly Pro Pro Arg Glu Ser Gln Pro Glu Ser Ser Leu
Ile Glu Asp His Gly Gly Gly Leu Leu Ala Asn Gln Ser His Asn Ala Gln Cys
Phe Arg Met Met Asp Val Ala Trp Ser Pro Thr Arg Val Thr Thr Arg Lys Val
---
CCT AGA GTA GTA CAG GTG GCG GGT CCT CCC GCA AGA CTG ACA CCA AGC GAA CTG
1521 1530 1539 1548 1557 1566
GAA TCT CAT CAT GTC CAC CGC CCA GGA GGG CGT TCT GAC TGT GGT TCG CTT GAC
---
Glu Ser His His Val His Arg Pro Gly Gly Arg Ser Asp Cys Gly Ser Leu Asp
Asn Leu Ile Met Ser Thr Ala Gln Glu Gly Val Leu Thr Val Val Arg Leu Thr
Ile Ser Ser Cys Pro Pro Pro Arg Arg Ala Phe *** Leu Trp Phe Ala *** Gln
---
Ile Asp Ser Pro Ala Pro Ser Ala Pro Thr Ser Ser Ala Met Lys Gly Glu Gly
Tyr Ile Arg Leu His Pro Leu Pro Pro His Gln Leu His Trp Lys Glu Lys Glu
Thr Tyr Gly Phe Thr Arg Ser Leu Arg Thr Asn Phe Ile Gly Asn Lys Arg Arg
---
TCA TAT AGG CTT CCA CGC CCT CTC CGC CCA CAA CTT CTA CGG TAA AAA GGA AGA
1575 1584 1593 1602 1611 1620
AGT ATA TCC GAA GGT GCG GGA GAG GCG GGT GTT GAA GAT GCC ATT TTT CTT TCT
---
Ser Ile Ser Glu Gly Ala Gly Glu Ala Gly Val Glu Asp Ala Ile Phe Pro Ser
Val Tyr Pro Lys Val Arg Glu Arg Arg Val Leu Lys Met Pro Phe Phe Leu Leu
Tyr Ile Arg Arg Cys Gly Arg Gly Gly Cys *** Arg Cys His Phe Ser Phe Ser

```

FIG. 8f

```

Ala Thr Val Thr Ala Pro Thr Ser Ser Gly Pro Ala Ala Ala Ser Ser Arg Ala
Leu Pro Leu Pro Pro Pro Pro Pro Arg Ala Leu Pro Pro Pro Pro Asp Pro
Trp Arg Tyr Arg His Arg Pro His Val Leu Trp Pro Arg Arg Arg Leu Ile Gln
---
GGT CGC CAT TGC CAC CGC CCC CAC CTG CTC GGT CCC CGC CGC CGC CTC CTA GAC
1629      1638      1647      1656      1665      1674
CCA GCG GTA ACG GTG GCG GGG GTG GAC GAG CCA GGG GCG GCG GCG GAG GAT CTG
---
Pro Ala Val Thr Val Ala Gly Val Asp Glu Pro Gly Ala Ala Ala Glu Asp Leu
Gln Arg *** Arg Trp Arg Gly Trp Thr Ser Gln Gly Arg Arg Arg Arg Ile Trp
Ser Gly Asn Gly Gly Gly Gly Gly Gly Arg Ala Arg Gly Gly Gly Gly Gly Ser Gly
---
Leu Ile Ala Ala Pro Ala Thr Asp Glu Glu Glu Thr Val Gly Gly Gln Ile Arg
Trp Ser Pro Gln Pro Pro Pro Thr Lys Lys Lys Pro Leu Ala Glu Lys Ser Val
Gly Leu His Ser Arg Pro Arg His Arg Arg Arg Arg Tyr Arg Arg Arg Pro Tyr
---
CGG TTC TAC CGA CGC CCC CGC CAC AGA AGA AGA AGC CAT TGC GGA GGA ACC TAT
1683      1692      1701      1710      1719      1728
GCC AAG ATG GCT GCG GGG GCG GTG TCT TCT TCT TCG GTA ACG CCT CCT TGG ATA
---
Ala Lys Met Ala Ala Gly Ala Val Ser Ser Ser Ser Val Thr Pro Pro Thr Ile
Pro Arg Trp Leu Arg Gly Arg Cys Leu Leu Leu Arg *** Arg Leu Leu Gly Tyr
Gln Asp Gly Cys Gly Gly Gly Val Phe Phe Phe Gly Asn Ala Ser Leu Asp Thr
---
*** Ile Gln Phe Arg Phe Phe His Ala Thr Leu Ile
Asp Tyr Arg Phe Val Phe Ser Thr Arg Gln Leu Tyr
Thr Met Asp Ser Phe Ser Leu Leu Ala Ser Tyr Thr Asn
---
GCA GTA TAG ACT TTT GCT TTC TTC ACG CGA CAT TCA TAA 5'
1737      1746      1755      1764
CGT CAT ATC TGA AAA CGA AAG AAG TGC GCT GTA AGT ATT 3'
---
Arg His Ile *** Lys Arg Lys Lys Cys Ala Val Ser Ile
Val Ile Ser Glu Asn Glu Arg Ser Ala Leu *** Val
Ser Tyr Leu Lys Thr Lys Glu Val Arg Cys Lys Tyr

```

FIG. 8g

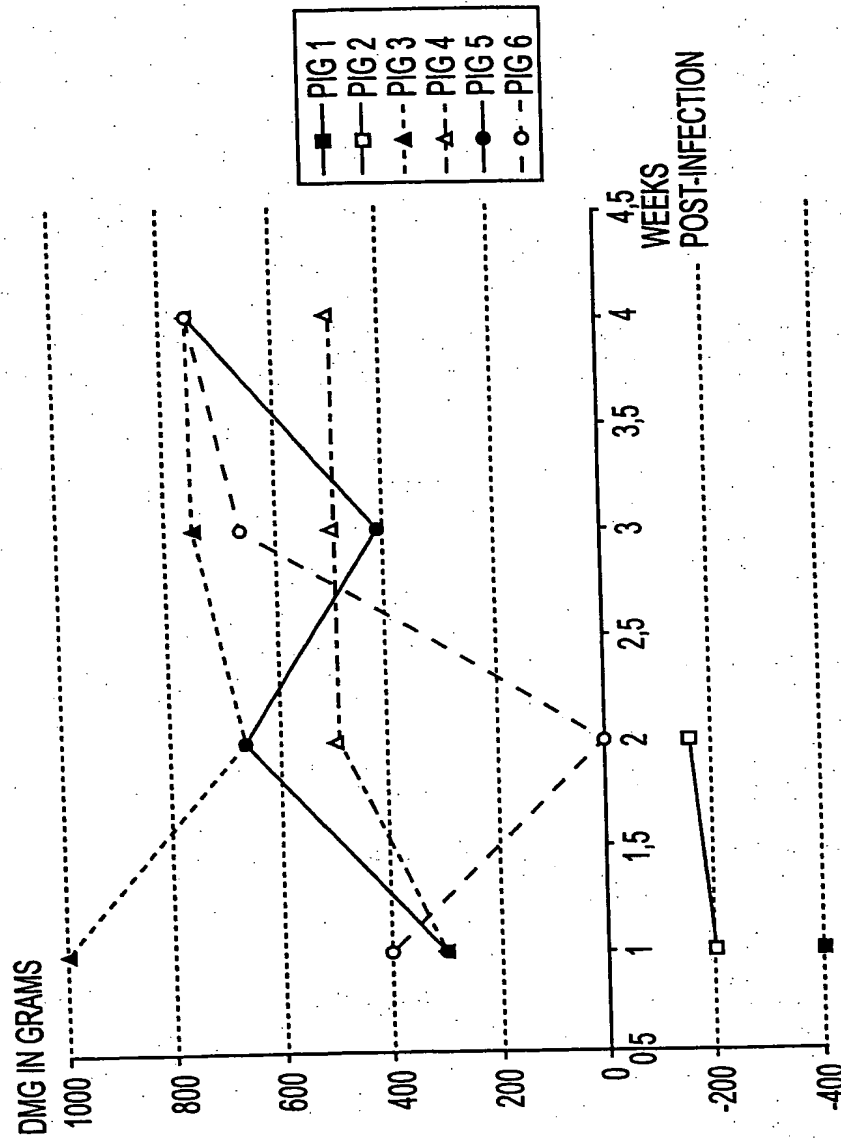


FIG. 9

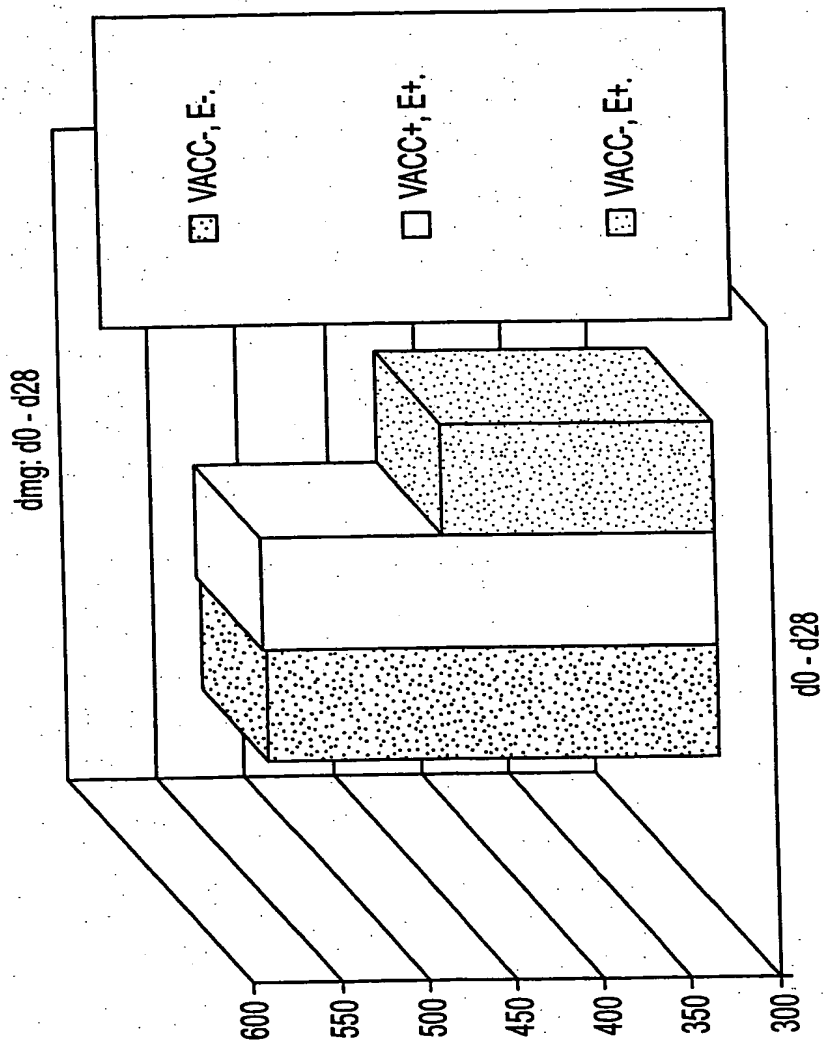


FIG. 10

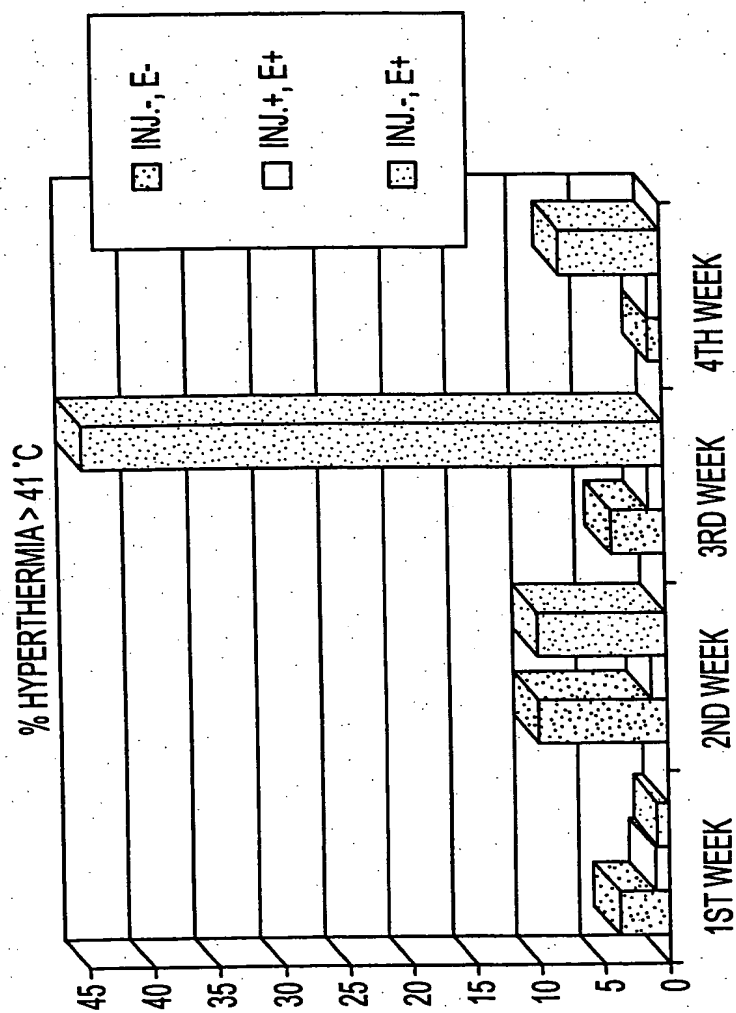
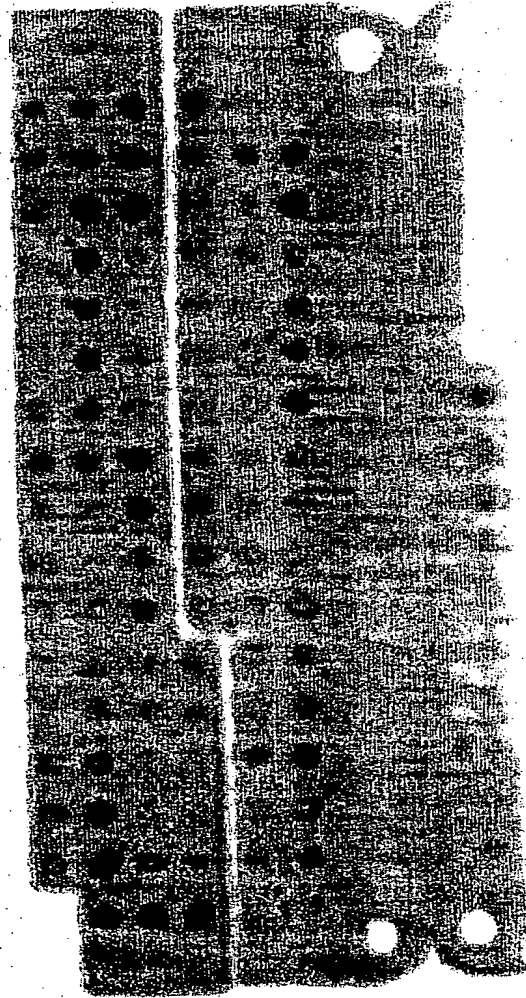


FIG. 11



TYPE B
SPOT NO. 104 TO 159

TYPE A
SPOT NO. 160 TO 215

FIG. 12

		50 51	
1			
pcvA	MTWPRRRYRR RRTPRSHLG NILRRRPYL VHPAFRNYRW RRKTGIFNSR LSREFVLT I. RGHSQPSWN		
pcvB	MTYPRRRYRR RHRPRSHLG QILRRRPWL VHP. RH YRW RRKNGIFNTR LSRTFGYTVK RTTVRTPSWA		
			peptides 188 to 189
		100 101	
	peptide 177		
pcvA	VNELRFNIGQ FLPPSGGTNP LPLPFQYRI RKAKYEFYPR DPITSNQRGV GSTVVILDAN FVTPSTNLAY		
pcvB	VDMMRFNIND FLPPGGGSP RSVPFYRI RKVKVEFWPC SPITQGRGV GSSAVILDDN FVTKATALY		
	peptide 121		peptides 132 to 133
			peptide 208
	150 151		
pcvA	DPYINYSSRH TIRQPTYHS RYFTPKPELD QTIDWFQPNN KRNQLWLHLN THTNVEHTGL GYALQNATTA		
pcvB	DPYVNYSSRH TITQPSYHS RYFTPKPVLD FTIDYFQPNN KRNQLWLRLQ TAGNVDHVGL GTAFENSIYD		
			peptide 152
		235	
pcvA	QNVVRLTIY VQREFILKD P.LNE		
pcvB	QEYNIRVTMY VQREFNFKD PPLNP		

FIG. 13

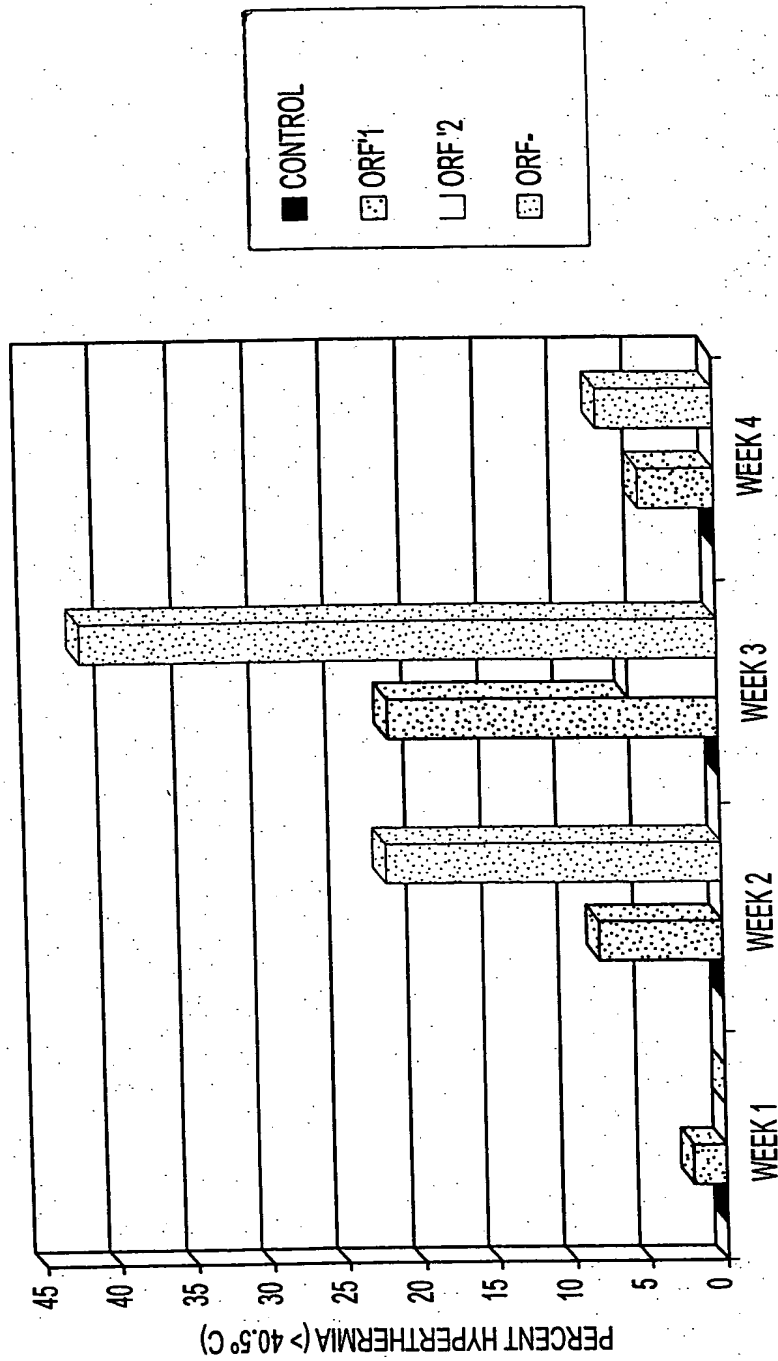


FIG. 14

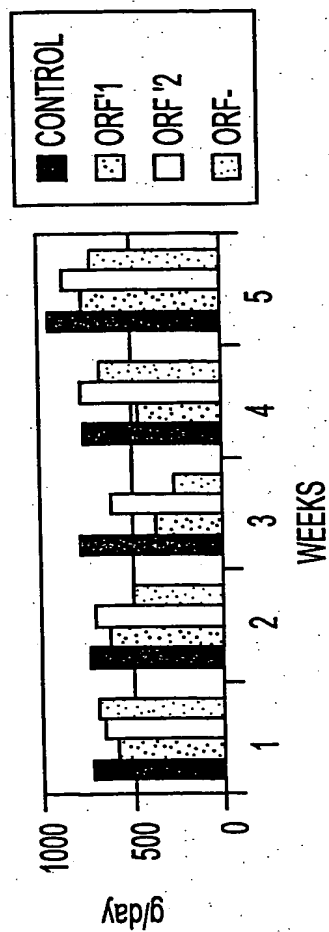


FIG. 15

Title: CIRCOVIRUS SEQUENCES ASSOCIATED
WITH PIGLET WEIGHT LOSS DISEASE (PWD)
Inventor(s): Andre JESTIN et al.
Appl. No.: Unassigned

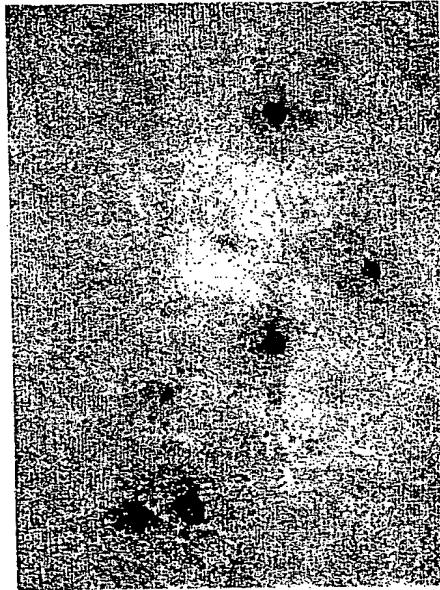


FIG. 16